Republic of Yemen

Ministry of Higher Education & Information Technology

Emirates International University

Faculty of Medical Sciences

Department of Clinical Pharmacy

Bachelor of Pharm D

Course Specification of Pharmacotherapy Module VIII : Nuclear Pharmacy & Oncology

Course No. (PP 508)

Prepared by:	Reviewed by:	Head of the Department:	Quality Assurance head	Dean:
Dr. Ali Alyahawi	Dr. -----			

I. Course Identification and General Information:

1	**Course Title:**	Pharmacotherapy Module VIII : Nuclear Pharmacy & Oncology			
2	**Course Code & Number:**	PP 508			
3	**Credit Hours:**	**Credit Hours**	**Theory Hours**		**Lab. Hours**
			Lecture	**Exercise**	
		2	2	--	--
4	**Study Level/ Semester at which this Course is offered:**	5th Level / 1st Semester			
5	**Pre –Requisite (if any):**	Pharmacology I-III			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Bachelor of Pharm D			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester based System			
10	**Mode of Delivery:**	Full Time			
11	**Location of Teaching the Course:**	Faculty of Medical Sciences			
12	**Prepared by:**	Dr. Ali Alyahawi			
13	**Date of Approval:**				

II. Course Description:

Pharmacotherapy in Nuclear Pharmacy and Oncology is a specialized course that focuses on the use of medications for the treatment of cancer. It encompasses various aspects such as the mechanisms of action and application of different types of medications, including radioactive ones used in nuclear medicine. The course also covers nuclear medicine techniques for tumor imaging and therapeutic evaluation, as well as the role of nuclear pharmacists in managing and administering radioisotopes for therapeutic purposes. The course also explores the role of nuclear

pharmacists in managing radioisotopes for therapeutic use, covering safety regulations, handling, and ethical considerations.

III. Course Intended Learning Outcomes (CILOs) : (maximum 8) Upon successful completion of the course, students will be able to:		**Referenced PILOs** Learning out of program
	A. Knowledge and Understanding:	**I, A or E**	
a1	Identify the etiology, pathophysiology, and molecular basis of various types of cancer medications utilized in nuclear medicine.	I	A1
a2	Describe the common chemotherapy agents used in the treatment of oncology patients, including their mechanisms of action, pharmacokinetics, and adverse effects.	I	A1, A10
	B. Intellectual Skills:		
b1	Explain the role of nuclear pharmacy and its implications in the management of *radiopharmaceuticals for the diagnosis and* treatment of cancer.	A	B7
b2	Manage the rational pharmacotherapy regimens and common adverse events associated with oncology medications, including appropriate supportive care measures.	A	B7
	C. Professional and Practical Skills:		
c1	Interpret clinical research and evidence-based guidelines regarding the use of *oncology medications and treatment* regimens.	A	C5
c2	Demonstrate competence in the safe handling, preparation, and administration	A	C5

	of radiopharmaceuticals for various nuclear *medicine procedures.*		
	D. Transferable Skills:		
d1	Utilize therapeutic decision-making skills to choose suitable chemotherapy drugs and treatment plans	E	D5
d2	. Ethically and professionally apply knowledge and skills in pharmaceutical care to improve patient outcomes in the field of oncology pharmacotherapy.	E	D1, D3

(a) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Identify the etiology, pathophysiology, and molecular basis of various types of cancer medications utilized in nuclear medicine.	- Lectures - Assignment - Interactive discussion - Seminars - Case discussion - Office hour	Exam Assignment Quiz
a2- Describe the common chemotherapy agents used in the treatment of oncology patients, including their mechanisms of action, pharmacokinetics, and adverse effects.	- Lectures - Assignment - Interactive discussion - Seminars - Case discussion - Office hour	Exam Assignment Quiz

(b) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Explain the role of nuclear pharmacy and its implications in the management of radiopharmaceuticals *for the diagnosis and treatment of cancer.*	- Lectures - Assignment - Interactive discussion - Seminars	Exam Assignment Quiz

	- Case discussion - Office hour	
b2- Manage the rational pharmacotherapy regimens and common adverse events associated with oncology medications, including appropriate supportive care measures.	- Lectures - Assignment - Interactive discussion - Seminars - Case discussion - Office hour	Exam Assignment Quiz

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1- interpret clinical research and evidence-based guidelines regarding the use of oncology medications and treatment regimens	- Lectures - Assignment - Interactive discussion - Seminars - Case discussion - Office hour	Exam Assignment Quiz
C2- Demonstrate competence in the safe handling, preparation, and administration of radiopharmaceuticals for various nuclear medicine procedures.	- Lectures - Assignment - Interactive discussion - Seminars - Case discussion - Office hour	Exam Assignment Quiz

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Apply therapeutic decision-making skills to select appropriate chemotherapy agents and treatment regimens	- Interactive discussion - Seminars - Case discussion	Exam Assignment Quiz
d2- Ethically and professionally apply knowledge and skills in pharmaceutical care to improve patient outcomes in the field of oncology pharmacotherapy.	- Seminars - Case discussion	Oral Presentation

IV. Course Contents:

A. Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes
1.	*Introduction to* Oncology - Overview of	cancer and its prevalence - Cancer etiology and risk factors - Principles of oncogenesis and tumor biology	- 1	2	a1,a2,b1,b2
2.	Chemotherapy Agents -	Introduction to chemotherapy and its use in oncology - Classification and mechanisms of action of chemotherapy agents - Pharmacokinetics and pharmacodynamics of chemotherapy agents	1	2	a1,a2,b1,b2
3.	Adverse Effects of Chemotherapy -	Common adverse effects of chemotherapy - Management and prevention strategies for chemotherapy-induced toxicities - Supportive care measures for oncology patients	1	2	a1,a2,b1,b2,**c2**
4.	Personalized Medicine and Targeted Therapies	- Principles and strategies of personalized medicine in oncology - Molecular targeted therapies and their application in cancer treatment - Genetic testing and biomarkers for personalized treatment selection	1	2	a1,a2,b1,b2,c1,d1,d2
5.	Principles of Pharmaceutical Care in Oncology	- Role of the pharmacist in oncology care	1	2	a1,a2,b1,b2,c1,d1,d2

		- Medication reconciliation *and medication therapy* management in oncology - Communication and collaboration within multidisciplinary healthcare teams			
6.	Clinical Research in Oncology	Overview of clinical trials and their importance in oncology - Critical appraisal of oncology research literature - Understanding evidence-based guidelines for oncology pharmacotherapy	**1**	2	a1,a2,b1,b2,c1,d1,d2
7.	Breast Cancer Pharmacotherapy -	Introduction to breast cancer and its subtypes - Chemotherapy options and targeted therapies for breast cancer - Adjuvant and neoadjuvant treatment approaches for breast cancer	**1**	2	a1,a2,b1,b2,c1,d1,d2
8.	Midterm		**1**	2	a1,a2,b1,b2,c1,d1,d2
9.	Lung Cancer Pharmacotherapy -	Overview of lung cancer and its subtypes - Chemotherapy, targeted therapy, and immunotherapy options for lung cancer - Management of advanced and metastatic lung cancer	**1**	2	a1,a2,b1,b2,c1,d1,d2
10.	Colorectal Cancer Pharmacotherapy -	Introduction to colorectal cancer and its treatment modalities - Chemotherapy and targeted therapy options for colorectal cancer - Adjuvant and palliative treatment approaches for colorectal cancer	**1**	2	a1,a2,b1,b2,c1,d1,d2

11.	Genitourinary Cancer Pharmacotherapy -	Overview of prostate, bladder, and renal cell carcinoma - Treatment options and targeted therapies for genitourinary cancers - Management of advanced and metastatic genitourinary cancers	1	2	a1,a2,b1,b2,c1,d1,d2
12.	Hematologic Malignancies Pharmacotherapy	- Introduction to hematologic malignancies (leukemia, lymphoma, multiple myeloma) - Chemotherapy, immunotherapy, and targeted therapy options for hematologic malignancies - Supportive care considerations for hematologic malignancies	1	2	a1,a2,b1,b2,c1,d1,d2
13.	Gynecologic Cancer Pharmacotherapy -	Overview of ovarian, cervical, and endometrial cancers - Chemotherapy, targeted therapy, and hormonal therapy options for gynecologic cancers - Role of radiation therapy in gynecologic cancer treatment	1	2	a1,a2,b1,b2,c1,d1,d2
14.	Pediatric Oncology Pharmacotherapy -	Differences and challenges in pediatric oncology treatment - Chemotherapy protocols and targeted therapies for pediatric cancers - Supportive care and survivorship issues in pediatric oncology	1	2	a1,a2,b1,b2,c1,d1,d2
15.	Nuclear Pharmacy and Radiation Safety in Oncology -	Role of nuclear pharmacy in oncology treatment - Radiopharmaceuticals and their applications in oncology	1	2	a1,a2,b1,b2,c1,d1,d2

		- Radiation safety regulations *and guidelines in the* handling and administration of radiopharmaceuticals			
16	**Final Exam**		1	2	a1,a2,b1,b2,c1,d1,d2
Number of Weeks /and Units Per Semester				**16**	**32**

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Week Due	Contact Hours	Learning Outcomes (CILOs)
1	- None			
2	-			
3	-			
4	-			
5	-			
6	-			
7	-			
8	-			
9	-			
10	-			
11	-			
12	-			
Number of Weeks /and Units Per Semester: 12 weeks				

C. Tutorial Aspect: (ان وجدت)

No.	Tutorial	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Number of Weeks /and Units Per Semester				

V. Teaching Strategies of the Course:

- Lectures
- Assignment
- Interactive discussion
- Seminars
- Case discussion
- Office hour

VI. Assessment Methods of the Course:

- Assignments
- Exam
- Quiz

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	**Assignment 1**: Each student presents of clinical trials and their importance in oncology	6th	5	a 1, a2, b1, b2, c1,, d1,

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
2	**Assignment 2:** Each students group presents updated guideline of pharmacotherapy of breast cancer	12th	5	a 1, a2, b1, b2, c1, c2, d1, d2
Total				**10**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	6th, 12th	10	10%	a 1, a2, b1, b2, c1,, d1
2	Quiz 1	6th	5	5%	a 1, a2, b1, b2, c1 , d2
3	Midterm Exam (Theory)	Week 7	20	20%	a 1, a2, b1, b2, c1,d2
4	Quiz 2	12th	5	5%	a 1, a2, b1, b2, c1, , d2
5	Final Exam (Theory)	Week 16	60	60%	a 1, a2, b1, b2, c1, d1,d2
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s):

1. Link, Wolfgang. 2019. Principles of cancer treatment and anticancer drug development. Cham: Springer International Publishing,
2. Chisholm-Burns et al, 2019. Pharmacotherapy principles & practice. ed. , 5th edition

2- Essential References.

1 -DiPiro et al, 11th edition, 2020. Pharmacotherapy: A Pathophysiological Approach, ed. 11th e
2. Carolin, 2018. Applied Therapeutics: The Clinical Use of Drugs, 11th edition.

3- Electronic Materials and Web Sites *etc.*

1 -www.accesspharmacy.com
2 -Disease management guidelines (specified in lecture notes)

	X. Course Policies: (Based on the Uniform Students' By law (2007)
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

Faculty of Medical Sciences

Department of Pharmacy

Bachelor of Pharm D

Course Plan (Syllabus) of Pharmacotherapy Module VIII : Nuclear Pharmacy & Oncology

Course No. (PP 508)

I. Information about Faculty Member Responsible for the Course:

Name of Faculty Member:		**Office Hours**					
Location& Telephone No.:							
E-mail:		SAT	SUN	MON	TUE	WED	THU

II. Course Identification and General Information:

1	**Course Title:**	Pharmacotherapy Module VIII : Nuclear Pharmacy & Oncology			
2	**Course Code & Number:**	PP 508			
3	**Credit Hours:**	**Credit Hours**	**Theory Hours**		**Lab. Hours**
			Lecture	**Exercise**	
		2	2	--	--
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5	**Pre –Requisite (if any):**	Pharmacology I-III			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Bachelor of Pharm D			
8	**Language of Teaching the Course:**	English			
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12	**Prepared by:**	Dr. Ali Alyahawi			
13	**Date of Approval:**				

III. Course Description:

Pharmacotherapy in Nuclear Pharmacy and Oncology is a specialized course that focuses on the use of medications for the treatment of cancer. It encompasses various aspects such as the mechanisms of action and application of different types of medications, including radioactive ones used in nuclear medicine. The course also covers nuclear medicine techniques for tumor imaging and therapeutic evaluation, as well as the role of nuclear pharmacists in managing and administering radioisotopes for therapeutic purposes. The course also explores the role of nuclear pharmacists in managing radioisotopes for therapeutic use, covering safety regulations, handling, and ethical considerations.

IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

	A. Knowledge and Understanding:
a1	Identify the etiology, pathophysiology, and molecular basis of various types of cancer medications utilized in nuclear medicine.
a2	Describe the common chemotherapy agents used in the treatment of oncology patients, including their mechanisms of action, pharmacokinetics, and adverse effects.
	B. Intellectual Skills:
b1	Explain the role of nuclear pharmacy and its implications in the management of radiopharmaceuticals for the diagnosis and treatment of cancer.
b2	Manage the rational pharmacotherapy regimens and common adverse events associated with oncology medications, including appropriate supportive care measures.
	C. Professional and Practical Skills:
c1	Interpret clinical research and evidence-based guidelines regarding the use of oncology medications and treatment regimens.
c2	Demonstrate competence in the safe handling, preparation, and administration of radiopharmaceuticals for various nuclear medicine procedures.

	D. Transferable Skills:
d1	Utilize therapeutic decision-making skills to choose suitable chemotherapy drugs and treatment plans
d2	. Ethically and professionally apply knowledge and skills in pharmaceutical care to improve patient outcomes in the field of oncology pharmacotherapy.

V. Course Contents:

A. Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1)	Introduction to Oncology - Overview of	cancer and its prevalence - Cancer etiology and risk factors - Principles of oncogenesis and tumor biology	- 1	2
2)	Chemotherapy Agents -	Introduction to chemotherapy and its use in oncology - Classification and mechanisms of action of chemotherapy agents - Pharmacokinetics and pharmacodynamics of chemotherapy agents	1	2
3)	Adverse Effects of Chemotherapy -	Common adverse effects of chemotherapy - Management and prevention strategies for chemotherapy-induced toxicities - Supportive care measures for oncology patients	1	2
4)	Personalized Medicine and Targeted Therapies	- Principles and strategies of personalized medicine in oncology - Molecular targeted therapies and their application in cancer treatment - Genetic testing and biomarkers for personalized treatment selection	1	2

5)	Principles of Pharmaceutical Care in Oncology	- Role of the pharmacist in oncology care - Medication reconciliation and medication therapy management in oncology - Communication and collaboration within multidisciplinary healthcare teams	1	2
6)	Clinical Research in Oncology	Overview of clinical trials and their importance in oncology - Critical appraisal of oncology research literature - Understanding evidence-based guidelines for oncology pharmacotherapy	1	2
7)	Breast Cancer Pharmacotherapy -	Introduction to breast cancer and its subtypes - Chemotherapy options and targeted therapies for breast cancer - Adjuvant and neoadjuvant treatment approaches for breast cancer	1	2
8)	Midterm		1	2
9)	Lung Cancer Pharmacotherapy -	Overview of lung cancer and its subtypes - Chemotherapy, targeted therapy, and immunotherapy options for lung cancer - Management of advanced and metastatic lung cancer	1	2
10)	Colorectal Cancer Pharmacotherapy -	Introduction to colorectal cancer and its treatment modalities - Chemotherapy and targeted therapy options for colorectal cancer - Adjuvant and palliative treatment approaches for colorectal cancer	1	2

11)	Genitourinary Cancer Pharmacotherapy -	Overview of prostate, bladder, and renal cell carcinoma - Treatment options and targeted therapies for genitourinary cancers - Management of advanced and metastatic genitourinary cancers	1	2
12	Hematologic Malignancies Pharmacotherapy	- Introduction to hematologic malignancies (leukemia, lymphoma, multiple myeloma) - Chemotherapy, immunotherapy, and targeted therapy options for hematologic malignancies - Supportive care considerations for hematologic malignancies	1	2
13	Gynecologic Cancer Pharmacotherapy -	Overview of ovarian, cervical, and endometrial cancers - Chemotherapy, targeted therapy, and hormonal therapy options for gynecologic cancers - Role of radiation therapy in gynecologic cancer treatment	1	2
14	Pediatric Oncology Pharmacotherapy -	Differences and challenges in pediatric oncology treatment - Chemotherapy protocols and targeted therapies for pediatric cancers - Supportive care and survivorship issues in pediatric oncology	1	2
15	Nuclear Pharmacy and Radiation Safety in Oncology -	Role of nuclear pharmacy in oncology treatment - Radiopharmaceuticals and their applications in oncology - Radiation safety regulations and guidelines in the handling and administration of radiopharmaceuticals	1	2
16	**Final Exam**		1	2

		Number of Weeks /and Units Per Semester	16	32

B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Week Due	Contact Hours
1	None		
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
Number of Weeks /and Units Per Semester: 12 weeks			

No.	Tasks/ Experiments	Week Due	Contact Hours
1	None		
2			

No.	Tasks/ Experiments	Week Due	Contact Hours
3	-		
4	-		
5	-		
6	-		
7	-		
8	-		
9			
10	-		
11	-		
12	-		
Number of Weeks /and Units Per Semester: 12 weeks	-		

C. Tutorial Aspect:

No.	Tutorial	Number of Weeks	Contact Hours
1			
2			
3			
4			
5			
6			
7			
8			

No.	Tutorial	Number of Weeks	Contact Hours
9			
10			
Number of Weeks /and Units Per Semester			

VI. Teaching Strategies of the Course:

- Lectures
- Assignment
- Interactive discussion
- Seminars
- Case discussion
- Office hour

VII. Assessment Methods of the Course:

- Assignments
- Exam
- Quiz

VIII. Assignments:

No.	Assignments	Week Due	Mark
1	**Assignment 1:** Each student presents of clinical trials and their importance in oncology	6th	5
2	**Assignment 2:** Each students group presents updated guideline of pharmacotherapy of breast cancer	12th	5
Total			

IX. Schedule of Assessment Tasks for Students During the Semester:

خطأ! لم يتم العثور على مصدر المرجع.
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X. Learning Resources:

1- Required Textbook(s):

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	1 -www.accesspharmacy.com 2 -Disease management guidelines (specified in lecture notes)

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