

Professional Certificate in Clinical Oncology Pharmacy for Undergraduate and Graduate Clinical Pharmacy Students

Introduction:

The Pharmacist is one of the main pillars of patient care and clinical decision making, to ensures optimal medical care for patients. Oncology is a rapidly expanding field in healthcare, and as the population ages, treatments for cancer are becoming more important and more sophisticated. The amount of information that needs to be mastered to practice in this field is immense and dynamically changing. As part of the cancer patient treatment, clinical oncology is the non-surgical cancer treatment including radiotherapy and systemic therapies. In fact, clinical oncology pharmacy has recently become one of the most important specialties of clinical pharmacy.

As a part of the multidisciplinary team, clinical oncology pharmacist provides evidence-based, patient-centered care for cancerous patients including treatment assessment and monitoring for potential adverse drug reactions and interactions to optimize therapeutic goals and minimize toxicity. Consequently, the personalized clinical pharmacy practice, addresses the pharmaceutical care of both adults and children living with cancer in different settings. Accordingly, the clinical oncology pharmacist must have the advanced knowledge and experience to manage and educate the patient and his care givers about his disease including medication therapy management, rational use of drugs, supportive measures to optimize safety and outcomes for individuals receiving treatment for cancer.

The in depth understanding of the molecular aspects of cancer opens new opportunities for therapeutic intervention that are quite distinct from the classical chemotherapeutic agents. Indeed, this offers novel prospective for selective cancer therapies that are tailored towards each individual cancer patient. Hence, the demand for professional specialized clinical pharmacists in the field of clinical oncology is increasing all over the world.

Program Vision, Mission, and Goals

Vision:

Achieving national as well as regional leadership in clinical oncology pharmacy practice.

Mission:

The Faculty of Pharmacy in collaboration with the Faculty of Medicine at Alexandria University is committed to provide the regional community with distinguished clinical oncology pharmacists who can work effectively with other healthcare professionals providing evidence-based pharmaceutical care for each cancer patient.

Aims:

1. In collaboration with the health care team, provide comprehensive medication management to oncology patients following a consistent patient care process.
2. Manage and facilitate the preparation and delivery of medications to support safe and effective drug therapy for oncology patients
3. Conduct quality improvement and research projects in the area of clinical oncology pharmacy
4. Provide effective education to oncology patients, caregivers, and the public

Internal Bylaws

Article (1): Professional Certificate Awarded

Upon the request of the Faculty of Pharmacy Council, the Faculty of Pharmacy awards the Professional Certificate in “Clinical Oncology Pharmacy” of 12 credit hours according to the credit hour system.

Note: This certificate is professional and does not qualify to higher academic degrees

Article (2): Study Language

The study in this program is in English

Article (3): Department Coordinating the Courses of the Certificate:

Department of Pharmacology & Toxicology – Faculty of Pharmacy – Alexandria University

Article (4): Departments Participating in Teaching the Courses of the Certificate:

#	Department	Alexandria University Faculty
1	Pharmacology & Toxicology	Pharmacy
2	Pharmacy Practice & Clinical Pharmacy	Pharmacy
3	Industrial Pharmacy	Pharmacy
4	Pharmaceutical Microbiology & Immunology	Pharmacy
5	Department of Oncology & Nuclear Medicine	Medicine

- The faculty members of Department of Oncology & Nuclear Medicine at the Faculty of Medicine participate in teaching all the topics in courses related to clinical management and treatment of cancer patient, whereas the faculty members of the Faculty of Pharmacy teach the pharmaceutical topics.
- Training of the students is performed under the supervision of both faculties at the University of Alexandria hospitals as well as other hospitals when needed
- National as well as international Experts from the field can also participate in delivering the courses as needed.

Article (5): Program Design and Teaching and Assessment Methods

This professional certificate contains 6 courses each for 2 credit hours with a total of 12 credit hours. Each course is one credits of theoretical studies and one credit (2 contact hours) of practical laboratory work. The duration of the study in the program is from 6 month up to a maximum of 2 academic years including the training.

The undergraduate PharmD (clinical Pharmacy) students can start enrolling in this certificate after semester 6. The 6 courses of the certificate can be distributed starting from semester 7 as 2 courses in semester 7 and 2 courses in semester 8, and then 2 courses in the summer, or one course in semester 7 and one in semester 8 followed by 2 courses in the summer and one course in semester 9 and the last course in semester 10.

For graduate students, the 6 courses can be registered together or sequentially because all their pre-requisites are already covered in undergraduate clinical pharmacy programs.

The courses offered in a summer semester are six to eight weeks of intensive study. The study in the summer semester is optional, whether for the student or the lecturer who teaches the course

according to the facilities available in the faculty. Courses can be taught fully or partially electronically, and students can be assessed, and exams can be taken electronically. Nonetheless, 60% of the total contact hours in the certificate are performed face to face.

The credit hour is the unit of study and is equivalent to one contact hour of theoretical weekly study or two contact hours of practical lessons in one semester (15 weeks), or four contact hours of field training per week in a semester (a total of 50 contact hour of field training is equivalent to one credit hour per semester).

Article (6): Field Training

- For PharmD (Clinical Pharmacy) undergraduate students:
 - A round of six-weeks (150 contact hours equivalent to 3 credit hours) in the summer following the 4th level in PharmD Clinical Pharmacy Program should be in hospitals in the field clinical oncology
 - One of the clinical rounds in the 6th year in PharmD Clinical Pharmacy Program should be in hospitals in the field clinical oncology. The round is six-weeks (150 contact hours equivalent to 3 credit hours)
- For graduate students: Three-month training in hospitals in the filed clinical oncology (300 contact hours equivalent to 6 credit hours).

Article (7): Registration Requirements:

The following requirements are mandatory to register in this certificate

- This professional certificate is intended for undergraduate students of the PharmD (Clinical Pharmacy) \ Bachelor of clinical Pharmacy program at Alexandria University Faculty of Pharmacy as well as graduates of Bachelor of clinical Pharmacy and PharmD (Clinical Pharmacy) Alexandria University and other national and global universities.
- Enrolled undergraduate students must have a minimum cGPA of 3 or more.
- Enrolled graduates must have a minimum cGPA of 2.7 or more
- **Pre-requisite:** The following courses or their equivalent should be passed prior to applying to this certificate.

Course Title	Course Code	Credit Hours		
		Lect.	P/T	Total
Community Pharmacy Practice	09-PP 506	2	1	3
Hospital Pharmacy	09-PP 607	2	1	3
Clinical Pharmacy Practice	09-PP 608	2	1	3
First Aid and Basic Life Support (BLS)	02-PO 609	1	1	2

The faculty assigns for each group of 25 students an academic advisor from the faculty members who performs the tasks of care and guidance for these students and assists students in choosing courses in each semester. The opinion of the academic advisor is advisory and non-binding. Each student must personally register the courses he/she wishes to study in each semester. However, the courses and the number of credit hours should be chosen via consultation and agreement with the academic advisor.

If the cGPA of regular bachelor's degree of the undergraduate student dropped during his registration of this certificate to below 3 after registering, the student shall stop registering any more courses in this certificate till his bachelor's cGPA reaches 3 again.

The student should fill out the registration form of the courses at the specified times according to the announced calendar for this certificate, and it is not permissible to attend the study until after the registration process has ended.

The student is not allowed to register later than the specified times except with a compulsory excuse accepted by the faculty, provided that the delay period does not exceed a week from the end of the registration period.

Article (8): Academic Load

Undergraduate students are not allowed to register more than 2 courses per semester, whereas graduate students can register from one up to the whole 6 courses together if they have already passed courses equivalent to all of the prerequisites in their undergrad bachelor's degree.

After completing the registration procedures, the student may add or drop a course or more in any semester, provided that this is during the specified periods according to the announced university calendar.

After registration, the student may also withdraw from one or more courses without being considered failing in this course, if he/she submits the request to withdraw during the specified periods according to the university calendar announced.

Article (9): Attendance

The student must attend the theoretical lectures, group discussions, practical sessions, field training and assignments, and the Faculty Council, upon the request of the councils of the relevant scientific departments, may deprive the student of applying for the final written examination if his/her absence exceeds 25% of the total contact hours for each course. A grade of (FW) is made for him/her and he/her must re-sit the course.

The student must sit for the final written exams according to the dates determined for them in the faculty calendar announced. The student is not considered to be a failure in case of absence for a compulsive excuse accepted by the Faculty Council. The student or his/her guardian shall fill an incomplete course request, and an incomplete interim assessment is calculated in this course Incomplete (I).

Article (10): Grading and Assessment System

The final grade of the course consists of the sum of grades for the semester work and the practical, written and oral exams (if any), as indicated in the study plan schedules. The minimum passing score for any course is 60% of the total score for this course, and the student is not successful in any course unless he/she obtains 30% of the final written exam score. Each course is scored out of 100.

The percentage of final grades and estimates are as shown in the following table, which is the same as in the bylaws of the PharmD (clinical Pharmacy) undergraduate program (approved from the Pharmaceutical Studies Sector Committee in the Supreme Council of Universities).

The student's result in each course is estimated with one of the following:

Description of Grade	Grade	Points	Percentage
Excellent	A ⁺	4.00	95 and more
	A	3.85	From 90 to less than 95
	A ⁻	3.7	From 85 to less than 90
Very Good	B ⁺	3.3	From 82.5 to less than 85
	B	3	From 77.5 to less than 82.5
	B ⁻	2.7	From 75 to less than 77.5
Good	C ⁺	2.3	From 72.5 to less than 75

	C	2	From 67.5 to less than 72.5
	C⁻	1.7	From 65 to less than 67.5
Satisfactory	D⁺	1.3	From 62.5 to less than 65
	D	1	From 60 to less than 62.5
Fail	F	0	Less than 60
Withdrawn	W	-	
Forced withdrawal	FW	-	
Military withdrawal	MW	-	
Incomplete	I	-	
Absent	E	-	
Audit	AU	-	

***I:** The student gets this symbol if the attendance rate is fulfilled and he/she is unable to enter the final and oral written exam (if any) for one or more academic courses for reasons accepted by the Faculty Council, and he/she must perform the remaining exams only at a date not later than 3 months from the date of the missed exams and the student keeps his/her scores during the semester.

****E:** The student gets this symbol if he/she is unable to enter the final written and/or oral exam (if any) at the aforementioned date in the previous paragraph because the compelling reason has not disappeared, and the student must register in this course when it is offered again and study it fully again and he/she will receive the new grades that he/she will score.

There are other evaluation symbols that are not matched by points - used in some graduation requirements - and they are:

P: Satisfactory level for a course not included in the GPA, such as training (Pass/Fail)

U: Ungraded Course

The student's grade point average (GPA) and cumulative GPA (cGPA) are calculated as follows:

A- The value of the assessment for each course (the points shown in the previous table) is multiplied by the number of credit hours for this course to get the number of points for each course in the semester.

B - Points are summed for all academic courses in which the student is registered in one semester.

C - The total points of all the courses are divided by the total credit hours recorded for the student in one semester, in order to obtain the grade point average, GPA of that semester, as follows:

$$\text{Grade Point Average (GPA) in a semester} = \frac{\text{Total Number of Points in the semester}}{\text{Total Number of Registered Credit Hours in that semester}}$$

The GPA ranges between 0 to 4.

Cumulative Grade Point Average, cGPA is calculated as follows:

$$\text{Cumulative Grade Point Average, cGPA} = \frac{\text{Total Number of Points in all semesters}}{\text{Total Number of Registered Credit Hours in all semester}}$$

In calculating the GPA or cGPA, the result is rounded to two decimal places.

The student fails a course in the following cases:

- The student is absent in the final written exam without an excuse accepted by the Faculty Council.
- The student achieves less than 30% of the final written exam score.
- The student achieves less than 60% of the total score of the course.

Article (11): Student Discipline System

Students enrolled in this program are subject to the disciplinary system set out in the Egyptian Universities Regulatory Law and its executive regulations.

Article (12): Course Coding

The courses in this program are considered as elective courses of PharmD (clinical Pharmacy) undergraduate students and accordingly, these courses follow the same coding system as the electives in their relevant departments.

Key for Course Type Abbreviations

PA	Analytical Chemistry Courses
PB	Biochemistry Courses
PC	Pharmaceutical Chemistry Courses
PG	Pharmacognosy Courses
PM	Microbiology and Immunology Courses
PN	Industrial Pharmacy Courses
PO	Pharmacology and Toxicology Courses
PP	Pharmacy Practice Courses
PT	Pharmaceutics Courses
E	Elective Course
NP	Non-pharmacy Courses

Article (13): Suggested Study Plan

Suggested Study Plan:

Course Title	Course Code	Credit Hours			Prerequisite	Department coordinating the course	Semester
		Lect.	P/T	Total			
Palliative Care for Cancer Patients	02-POE 05	1	1	2		Pharmacology & Toxicology	7 or 8
Cancerous Patient Care	09-PPE 03	1	1	2		Pharmacy Practice & Clinical Pharmacy	7 or 8
Advanced Oncology Pharmacotherapy	02-POE 04	1	1	2	Pharmacotherapy of Oncological Diseases and Radio pharmacy (02-PO 811)	Pharmacology & Toxicology	8 or 4th Summer
Oncology Pharmacy Practice	09-PPE 04	1	1	2	- Pharmacotherapy of Oncological Diseases and Radio pharmacy (02-PO 811)	Pharmacy Practice & Clinical Pharmacy	8 or 4th Summer

					-Clinical Pharmacokinetics (PO809)		
Targeted and Novel Therapy in Oncology	03-PNE 03	2	0	2	Advanced Drug Delivery Systems (01-PT 705)	Industrial Pharmacy	9, 10 or 4th summer
Public Health and Risk Management in Oncology	04-PME 04	2	0	2	Public Health and Preventive Medicine (04-PM 805)	Pharmaceutical Microbiology & Immunology	9, 10 or 4th summer

Lect.. = Lecture, P/T = Practical/ Tutorial

Pharmacy Practice & Clinical Pharmacy at the Faculty of Pharmacy and Department of Oncology & Nuclear Medicine at the Faculty of Medicine participate in coordination of the training.

Pre-requisites are mandatory only for undergraduate PharmD (clinical Pharmacy) candidates. Graduate students of clinical pharmacy programs should have passed equivalent courses in their relevant undergraduate program. If not, these pre-requisite courses should be attended and passed first as a pre-requisite.

Distribution of Marks within the courses

Course Title	Course Code	Examination Marks				Total Marks	Final Exam. Hours
		Period.	Course work	Wr.	Oral		
Palliative Care for Cancer Patients	02-POE 05	15	25	50	10	100	1
Cancerous Patient Care	09-PPE 03	15	25	50	10	100	1
Advanced Oncology Pharmacotherapy	02-POE 04	15	25	50	10	100	1
Oncology Pharmacy Practice	09-PPE 04	15	25	50	10	100	1
Targeted and Novel Therapy in Oncology	03-PNE 03	15	25	50	10	100	1
Public Health and Risk Management in Oncology	04-PME 04	15	25	50	10	100	1
Total						600	

Period. = Periodical, Wr. = Written

Article (14): Courses Description

Clinical Oncology Minor Professional Certificate includes six courses each of two credit hours (1 credit hours of Lectures +1 credit hour of practical or tutorials)

02-POE 04 Advanced Oncology Pharmacotherapy (1+1)

This course will discuss Clinical Presentation, Diagnosis cancer staging, prognosis, and guidelines of treatment of: Digestive Cancers, Breast, Ovarian Cancer, Endometrial, Prostate Cancers, Urological Cancers, Melanoma and non-melanoma skin cancers, Hematological malignancies, Head/Neck Cancers, Lung Cancer, Gynecological cancers, Treatment of Pediatric Oncology Patients, Treatment of Geriatric Oncology Patients. Identify potential mechanisms of tumor resistance in order to design or modify pharmacotherapeutic regimens.

02-POE 05 Palliative care for cancer patients (1+1)

The theoretical and practical issues applicable to the palliation of symptoms for patients with advanced cancer and end-of-life care will be studied. The course will look to improve the competence of practitioners delivering high quality palliative care in emotion situations. The course is divided into four strands, Total parenteral nutrition in Cancer Patients, Pain management, psychological distress management.

09-PPE 03 Cancerous Patient Care (1+1)

This course will discuss establishing therapeutic goals and clinical practice guidelines implementation including dose calculation of different drugs, monitoring anticipated adverse effects and interactions of anticancer drugs and radiotherapy. Treatment-related complications, toxicity grading and assessment will also be discussed. The course will also highlight clinical pharmacy interventions in hemato-oncology department including Emergency situations and proper management of Extravasation. The students will also design & provide pharmaceutical care plan, and supportive care including cancer-induced nausea & vomiting, hematological & non-hematological toxicities. The course will enable students to practice Medication Therapy Management services to cancerous patients, in addition to proper documentation tools.

09-PPE 04 Oncology Pharmacy Practice (1+1)

This course will discuss pharmacokinetics & therapeutic drug monitoring of antineoplastic drugs. This course will also shed the light on comorbidities affecting treatment response and special populations with cancer including pregnancy and lactation, obese patients, and oncology patients with organ dysfunctions. The course will also focus on good practice in Centralized Intravenous Additive Services (CIVAS), in addition to chemical & microbiological stability of cytotoxic drugs. Hands on safe handling of hazardous drugs & the proper use & disposal of Personal Protective Equipment (PPE) will be mastered, in addition to Spill-Kit and Waste Disposal. The basic principles of medication use evaluation, pharmacovigilance, medication errors and risk assessment will also be highlighted.

03-PNE 03 Targeted and Novel Therapy in Oncology (2+0)

This course will discuss targeted therapy of cancer, that uses drugs or other substances to precisely identify and attack certain types of cancer cells and novel treatment approaches. The course will cover: Introduction to Proteins & Monoclonal Antibodies, Biosimilars, Basics of Chimeric Antigen Receptor (CAR) T Cells, Complications of CAR T Cell Therapy, Bispecific T Cell Engagers (BiTEs), Tumor Vaccines, Oncolytic Viruses, Advances in Checkpoint Blockade Therapy, Novel CAR Cells, Combination Treatments, other targeted therapies in addition to clinical trials and research and the ethical consideration of investigational drugs studies.

04-PME 04 Public Health and Risk Management in Oncology (2+0)

The course will discuss cancer prevention, screening, and early detection strategies. Modifiable and non-modifiable risk factors will also be highlighted. Students will explore resources that inform the public about reliable sources of information, cancer-support organizations, and information centers.

Related Programs:

- MSc of Cancer Pharmacology: (1 year) online- University of Bradford
- BPS Board Certified Oncology Pharmacist (BCOP) program
- American board of clinical pharmacy- oncology
- European Specialization in Oncology Pharmacy (EUSOP)
- Egyptian Guide for Oncology Pharmacy Practice 2022