

**Republic of Yemen**

**Ministry of Higher Education & Scientific Research**

**Emirates International University**



**Faculty of Medical & Health Sciences**

**Department of Pharmacy**

**Bachelor of Pharmacy**

**Course Specification of**

**Mathematics and pharmaceutical calculation**

**Course No. (PHAR.CAL101)**



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Prepared by:

Dr. Magyed Alwan

Reviewed by:

Dr. ---

Head of the Department:

Quality Assurance head

Dean:

Handwritten signatures for all roles: Prepared by, Reviewed by, Head of the Department, Quality Assurance head, and Dean.

## I. Course Identification and General Information:

1	Course Title:	Mathematics and Pharmaceutical Calculations			
2	Course Code & Number:	PHAR.CAL101			
3	Credit Hours:	Credit Hours	Theory Hours		Lab. Hours
			Lecture	Exercise	
		2	--	--	--
4	Study Level/ Semester at which this Course is offered:	1 Level / 1 Semester			
5	Pre –Requisite (if any):	None			
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 & Health Sciences.			
12	Prepared by:	Dr. Maged Alwan			
13	Date of Approval:				

## II. Course Description:

Course will provide the student all terms, abbreviations, calculations of various pharmaceutical dosage forms concentration and how to dispense the doses prescribed by the doctor. The student able to Calculate the proper dose of drugs for adults and pediatrics.



III. Course Intended Learning Outcomes (CILOs) : <b>(maximum 8)</b> Upon successful completion of the course, students will be able to:		Referenced PILOs Learning out of program	
<b>A. Knowledge and Understanding:</b>		I, A or E	
a1	Distinguish the methods of pharmaceutical calculation		A12
a2	Recognize the proper medical terminology, abbreviations and symbols in health reports and pharmacy practice		A9
<b>B. Intellectual Skills:</b>			
b1	Calculate the proper dose of drugs for adults and pediatrics		B9
b2	Apply simple mathematical conversions for weight, volume, temperatures		B8
<b>C. Professional and Practical Skills:</b>			
c1	Utilize the proper medical terminology, to communicate with other health care professionals		C5
c2	Employ proper calculations for preparation of different pharmaceutical preparations		C6
<b>D. Transferable Skills:</b>			
d1	Communicate effectively with patients and health care professionals		D1

d2	Work effectively as a part of a team to perform the required tasks			D3
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**(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:**

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Distinguish the methods of pharmaceutical calculation	<ul style="list-style-type: none"> <li>▪ Active Lectures</li> <li>▪ Discussion</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final Exam</li> </ul>
a2	Recognize the proper medical terminology, abbreviations and symbols in health reports and pharmacy practice	<ul style="list-style-type: none"> <li>▪ Active Lectures</li> <li>▪ Discussion</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final Exam</li> </ul>
a3		<ul style="list-style-type: none"> <li>▪</li> </ul>	<ul style="list-style-type: none"> <li>▪</li> </ul>

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

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1	Calculate the proper dose of drugs for adults and pediatrics	<ul style="list-style-type: none"> <li>▪ Active Lectures</li> <li>▪ Discussion</li> </ul>	<ul style="list-style-type: none"> <li>▪ Quiz</li> </ul>
b2	Apply simple mathematical conversions for weight, volume, temperatures	<ul style="list-style-type: none"> <li>▪ Active Lectures</li> <li>▪ Discussion</li> <li>▪ Problem-based learning,</li> </ul>	<ul style="list-style-type: none"> <li>▪ Quiz</li> </ul>

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

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Utilize the proper medical terminology, to communicate with other health care professionals	<ul style="list-style-type: none"> <li>▪ Active Lectures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final Exam</li> <li>▪ Lab Experiments</li> <li>▪</li> </ul>
c2	Employ proper calculations for preparation of different pharmaceutical preparations	<ul style="list-style-type: none"> <li>▪ Active Lectures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lab Experiments</li> </ul>

<b>(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:</b>		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
d1	Communicate effectively with patients and health care professionals	<ul style="list-style-type: none"> <li>Active Lectures</li> <li>Quiz</li> </ul>
d2	Work effectively as a part of a team to perform the required tasks	<ul style="list-style-type: none"> <li>Group learning</li> <li>Short essay</li> </ul>

#### IV. Course Contents:

##### A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	Introduction Some fundamentals of measurement and pharmaceutical calculations	Pharmacy definition, units arithmetic symbols, Fractions Ratios Length, weight and volume	1	2	a1, b1,c1
2	International System of Units Interpretation of prescription or medication order	Metric system Common system The apothecaries, Avoirdupois measure		2	b1, c2,d1
3	Household measures Reducing and enlarging formula	Applications	1	2	a1, b2
4	Density Specific gravity Specific volume	Applications	1	2	a1, b2
5	pharmaceutical measurement	Weight and volume of liquids and percentage preparation	1	2	a1,a2,b1, c1,d1
6	Percentage preparation Ratio strength Simple	Applications		2	a1,a2,b2, c2,d1

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
	conversion from percentage to ratio strength				
7	Mid-Term Theoretical Exam		1	2	a1-2, b1-2, c1-2
8	Dilution and concentration	Applications	1	2	a1, b2
9	Stock solution, Dilution	Applications	1	2	a1, b2
10	Allegation medial	Applications	1	2	a1,b1,1
11	Allegation alternate	Applications	1	2	a1,b1,c2
12	Calculation of pediatric dose according to body weight, age and body surface area	Applications	1	2	a1,a2,b1, c2,d1
13	Calculation of chemotherapeutic dose according to body weight, age	Applications	1	2	a1,a2,c2, d1,d2
14	Calculation of chemotherapeutic dose according to body surface area	Applications	1	2	a1,a2, b2,c2,d1, d2
15	Review	Revision	1	2	a1, b1, c1
16	Final Theoretical Exam	Exam	1	2	a1-2, b1-2, c1-2
Number of Weeks /and Units Per Semester					

## V. Teaching Strategies of the Course:

- Active Lectures
- Discussion
- Problem solving
- Group learning

### VI. Assessment Methods of the Course:

- Final Exam
- Written exam
- Quizzes
- Multi-source assessments
- Lab Experiments
- 

### VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignment: Search about Calculation of chemotherapeutic dose according to body weight, age	10 <sup>th</sup>	5	b1,c1,d1,d2
<b>Total</b>				

### 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	10 <sup>th</sup>	5	5%	b1,c1,d1,d2
2	Quizzes	12	5	5%	a1-2, b1-2, c1-2, d1-2
3	Mid-Term Theoretical Exam	7	20	20%	a1-2, b1-2, c1-2

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
4	Final Theoretical Exam	16	70	70%	a1-2, b1-2, c1-2
<b>Total</b>			<b>100</b>	<b>100%</b>	

## IX. Learning Resources:

- Written in the following order: Author, Year of publication, Title, Edition, Place of publication, Publisher.

### 1- Required Textbook(s) ( maximum two ):

- 1- A book prepared by the staff members
- 2- Howard C. Ansel.,2013, Pharmaceutical Calculation, Lippincott, (14th edition), England, Wil and Wilkins .
- 3- Jones, D., 2008, "FASTtrack Pharmaceuticals- dosage form and design" 1st edition, London, Pharmaceutical Press, .
- 4- Aulton, M.E. (ed). (2013) Pharmaceuticals, the design and manufacture of medicines. 4th edition, Edinburgh, Churchill Livingstone.

### 2- Essential References:

- 1- Loyd, V Allen J.,2013, Remington: The Science and Practice of Pharmacy 22nd edition, London, Pharmaceutical Press.

### 3- Electronic Materials and Web Sites etc.:

[www.pubmed.com](http://www.pubmed.com)  
<http://www.sciencedirect.com>

## X. Course Policies: (Based on the Uniform Students' By law (2007)

1	<b>Class Attendance:</b> 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	<b>Tardiness:</b> A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	<b>Exam Attendance/Punctuality:</b> 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	<b>Assignments &amp; Projects:</b> Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	<b>Cheating:</b> 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	<b>Forgery and Impersonation:</b> 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	<b>Other policies:</b> 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 & Health Sciences

### Department of Pharmacy

### Program of Pharm D

## Course Plan (Syllabus) of Mathematics and Pharmaceutical Calculations

**Course No.** ( PHAR.CAL101)

I. Information about Faculty Member Responsible for the Course:									
Name of Faculty Member:	Dr.maged alwan			Office Hours					
Location& Telephone No.:									
E-mail:				SAT	SUN	MON	TUE	WED	THU

## II. Course Identification and General Information:

1	Course Title:	Mathematics and Pharmaceutical Calculations			
2	Course Code & Number:	PHAR.CAL101			
3	Credit Hours:	Credit Hours	Theory Hours		Lab. Hours
			Lecture	Exercise	
		2	--	--	--
4	Study Level/ Semester at which this Course is offered:	1 Level / 1 Semester			
5	Pre –Requisite (if any):	None			
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 & Health Sciences.			
12	Prepared by:	Dr. Maged Alwan			
13	Date of Approval:				

## III. Course Description:

Course will provide the student all terms, abbreviations, calculations of various pharmaceutical dosage forms concentration and how to dispense the doses prescribed by the doctor. The student able to Calculate the proper dose of drugs for adults and pediatrics.

## IV. Course Intended Learning Outcomes (CILOs)

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

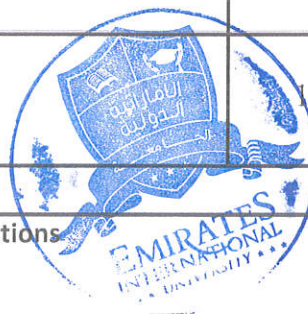
<b>Upon successful completion of the Course, student will be able to:</b>	
	<b>A. Knowledge and Understanding:</b>
a1	Distinguish the methods of pharmaceutical calculation
a2	Recognize the proper medical terminology, abbreviations and symbols in health reports and pharmacy practice
	<b>B. Intellectual Skills:</b>
b1	Calculate the proper dose of drugs for adults and pediatrics
b2	Apply <b>simple mathematical conversions</b> for weight, volume, temperatures
	<b>C. Professional and Practical Skills:</b>
c1	Utilize the proper medical terminology, to communicate with other health care professionals
c2	<b>Employ proper calculations for preparation of different pharmaceutical preparations</b>
	<b>D. Transferable Skills:</b>
d1	Communicate effectively with patients and health care professionals
d2	<b>Work effectively as a part of a team to perform the required tasks</b>

**V. Course Contents:**

**A. Theoretical Aspect:**

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	<b>Introduction</b> <b>Some fundamentals of measurement and pharmaceutical calculations</b>	<ul style="list-style-type: none"> <li>– Pharmacy definition, units</li> <li>– arithmetic symbols,</li> <li>– Fractions</li> <li>– Ratios</li> </ul> Length, weight and volume	1	2
2	<b>International System of Units</b> <b>Interpretation of prescription or medication order</b>	<ul style="list-style-type: none"> <li>– Metric system</li> </ul> Common system The apothecaries, Avoirdupois measure		2
3	<b>Household measures</b>	<ul style="list-style-type: none"> <li>– Applications</li> </ul>		2

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
	Reducing and enlarging formula			
4	Density Specific gravity Specific volume	– Applications	1	2
5	pharmaceutical measurement	– Weight and volume of liquids and percentage preparation	1	2
6	Percentage preparation Ratio strength Simple conversion from percentage to ratio strength	Applications	1	2
7	Mid-Term Theoretical Exam	–	1	2
8	Dilution and concentration	– Applications	1	2
9	Stock solution, Dilution	– Applications	1	2
10	Allegation medial	– Applications	1	2
11	Allegation alternate	– Applications	1	2
12	Calculation of pediatric dose according to body weight, age and body surface area	– Applications	1	2
13	Calculation of chemotherapeutic dose according to body weight, age	– Applications	1	2
14	Calculation of chemotherapeutic dose according to body	– Applications	1	2



No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
	surface area			
15	Review	- Revision	1	2
16	Final Theoretical Exam	- Exam	1	2
<b>Number of Weeks /and Units Per Semester</b>				

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	Introduction Some fundamentals of measurement and pharmaceutical calculations	Pharmacy definition, units arithmetic symbols, Fractions Ratios Length, weight and volume	1	2
2	International System of Units Interpretation of prescription or medication order	Metric system Common system The apothecaries, Avoirdupois measure		2
3	Household measures Reducing and enlarging formula	Applications	1	2
4	Density Specific gravity Specific volume	Applications	1	2
5	pharmaceutical measurement	Weight and volume of liquids and percentage preparation	1	2
6	Percentage preparation Ratio strength Simple conversion from percentage to ratio	Applications	1	2

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
	strength			
7	Mid-Term Theoretical Exam		1	2
8	Dilution and concentration	Applications	1	2
9	Stock solution, Dilution	Applications	1	2
10	Allegation medial	Applications	1	2
11	Allegation alternate	Applications	1	2
12	Calculation of pediatric dose according to body weight, age and body surface area	Applications	1	2
13	Calculation of chemotherapeutic dose according to body weight, age	Applications	1	2
14	Calculation of chemotherapeutic dose according to body surface area	Applications	1	2
15	Review	Revision	1	2
16	Final Theoretical Exam	Exam	1	2
<b>Number of Weeks /and Units Per Semester</b>				

## VI. Teaching Strategies of the Course:

- Active Lectures
- Discussion
- Problem solving
- Group learning

## VII. Assessment Methods of the Course:

- Final Exam
- Written exam
- Quizzes
- Multi-source assessments
  - Lab Experiments
  -

## VIII. Assignments:

No.	Assignments	Week Due	Mark
1	Assignment: Search about Calculation of chemotherapeutic dose according to body weight, age	10th	5
<b>Total</b>			

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

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	10th	5	5%
2	Quizzes	12	5	5%
3	Mid-Term Theoretical Exam	7	20	20%
4	Final Theoretical Exam	16	70	70%
<b>Total</b>	<b>100</b>			<b>100%</b>

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
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2	Quizzes	12	5	5%
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4	Final Theoretical Exam	16	70	70%



No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
Total			100	100%

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- 6-

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