UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH -107	Pharmacy Calculus/ Υπολογισμοί στη Φαρμακευτική	4
Prerequisites	**Department**	**Semester**
None	Health Science	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Compulsory	Pharmacy	Greek/English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Kalyvas Charalambos	1st
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-face	N/A	N/A

Course Objectives:

In Pharmacy Practice, accuracy in calculations performed by the pharmacist is critically important in order to provide safe and effective patient care. Both patients and other health care providers depend on the pharmacist's expertise and accuracy in performing pharmaceutical calculations. Therefore, the objectives of this course are to:

- explain the responsibility of the pharmacist to perform pharmaceutical calculations with the highest accuracy possible and its importance for achieving the optimum patient quality of life and survival
- outline the concepts of pharmaceutical calculations
- explain how to perform calculations related to the dispensing of pharmaceutical prescription and the preparation of pharmaceutical dosage forms
- practice real life examples of common calculations required to be performed in a pharmacy setting
- show students how to apply the knowledge and skills gained in this course to other courses of the program

Learning Outcomes:

Upon course completion, students are expected to be able to:

- understand and describe the importance of performing accurate pharmaceutical calculations in patient care and medication therapy management

- identify units of measurement and their abbreviations
- easily recognise and accurately execute calculations related to several aspects of pharmaceutics (e.g., pharmaceutical technology, clinical and preparation pharmacy, pharmacology, pharmaceutical chemistry, pharmacokinetics), and specifically:
    - implement concentration, dilution and ratio strength calculations
    - calculate density and specific gravity and use them for computing the relative quantities of components used for the preparation of pharmaceutical formulations
    - enlarge and reduce formulas
    - understand and apply dilutions as a concept in pharmaceutical formulation and analysis
    - execute conversions between different units of measurement and between expressions of drug strength
    - apply alligation method
    - execute dose calculations
    - calculate the rate and frequency of intravenous administration of parenteral formulations
    - implement calculations for determining the quantities and volumes of ingredients required for the preparation of pharmaceutical dosage forms (e.g. powders, suspensions, capsules, etc.)
    - execute calculations related to the preparation of isotonic solutions
- understand the practice problem prior to performing pharmaceutical calculation
- apply the necessary calculations in a focused and responsible manner
- review the calculations performed and consider the reasonableness of the answer

Course Content:

- Units of measurement and unit conversions
- Weighing and other measurements
- Calculation of errors in pharmaceutical mixtures
- Percentage, ratio strength, and other expressions of concentration
- Density and specific gravity
- Dilution and concentration of pharmaceutical solutions and other physical mixtures (altering product strength, use of stock solutions, alligation alternate)
- Alligation methods in pharmaceutical sciences and alligation calculations
- Formula calculations and adjustments, i.e., reducing and enlarging formulas
- Isotonic solutions
- Biological fluids and electrolytes (milliequivalents, millimoles, milliosmoles, osmolarity)
- Fundamental concepts of dosage calculations (e.g., number of doses, total amount of drug, etc.)
- Dosage calculations based on patient parameters, e.g., body surface area (BSA) and body

weight
- Parenteral medications calculations (e.g., infusion flow rates, infusion time)

Learning Activities and Teaching Methods:

Lectures and practice problems.

Assessment Methods:

Final exam, Midterm exam, assignments

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Lecturer's notes				
«Αρχές και υπολογισμοί στη Συνταγοτεχνία & Κλινική Φαρμακευτική»	Μιχαλάκης Σάββα	Ίων	2013	978-960-508-097-6
Pharmaceutical Calculations, 14th edition	H.C. Ansel	Lippincott Williams & Wilkins	2013	978-1451120363
Pharmaceutical Calculations	S. Parsons*	Parsons Printing Press	2013	978-0578063737

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Introduction to Pharmaceutical Calculations	Rees, Judith A; Smith, Ian; Watson, Jennie	Pharmaceutical Press	2015	978-0857112439

eBook, 4th edition				
Biochemical Calculations, 2nd edition	I.H. Segel	John Wiley and Sons	1976	978-0471774211