UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH-300	Pharmaceutical Technology I/ Φαρμακευτική Τεχνολογία I	6
Prerequisites	**Department**	**Semester**
IMPH-210	Health Sciences	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Compulsory	Pharmacy	Greek/English
Level of Course	**Lecturer**	**Year of Study**
1st Cycle	Mr Petrides Michael/Dr Sergides Andreas	3rd
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Provide students with the scientific background that is vital in solid dosage form design and preparation, since achieving effective treatment of a disease while minimizing adverse effects of a drug requires rational selection, design, formulation and administration of an appropriate delivery system and form.
- Obtain the knowledge needed for the development of solid dosage forms with appropriate properties, through understanding the quality characteristics of solid dosage forms, the methodologies necessary for their production, the characteristics of modified release drug delivery systems and the mechanisms through which drug release occurs from such systems, and the types and functions of excipients used in solid dosage forms.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Understand the need of formulating dosage forms
- Identify the criteria used for the selection of dosage form and route of administration
- Explain the basic principles applied in dosage form design and development

- List the drug and excipients properties that are studied during preformulation and outline their usefulness
- Describe the basic processes applied in the production of solid dosage forms (e.g., particle size measurement, particle flow characterization, powder mixing and evaluation, particle size separation and reduction, granulation etc.
- Recognize the methods used for the measurement of the above-mentioned characteristics, the equipment employed and their mode of operation
- Explain the properties, quality characteristics, and preparation methods of the various solid dosage forms (tablets, capsules, modified release drug delivery systems) and inhalation aerosols, as well as the quality controls applied in each dosage form
- Understand the function of different excipients used in the final drug formulation
- Determine the quality controls performed in each dosage form

Course Content:

Preformulation: Basic principles of dosage form design and development, physicochemical properties of active ingredients and excipients that are studied during this stage.
Powders: Characteristics and properties of pharmaceutical powders (e.g., size, shape, flow), measurement methods, particle size reduction, particle size separation, mixing, granulation.
Tablets: tablet types, tablet production, excipients used, quality characteristics and controls, types and procedures of tablet coating, tablet defects.
Capsules (hard and soft gelatin): characteristics, excipients used, capsule production and filling, quality controls.
Modified-release drug delivery systems: different types, formulation parameters, excipients used, drug release profiles from each type and parameters that affect release rate.
Pharmaceutical aerosols: deposition of solid particles on the lungs and properties that affect it, types of pharmaceutical aerosols, excipients and formulation parameters.

Laboratory Exercises:

Exercise 1: Preparation of a mixture used for tableting – Mixing/blending of pharmaceutical ingredients

Exercise 2: Calculation of power flow - Measurement of bulk and tapped density

Exercise 3: Particle size distribution measurement

Exercise 4: Table hardness, thickness and mass uniformity testing

Exercise 5: Disintegration and friability control of tablets

Exercise 6: Tablet content uniformity control

Exercise 7: Tablet dissolution testing

Exercise 8: Tableting

Learning Activities and Teaching Methods:

Lectures, class discussion, videos regarding the operation of preparation and quality control equipment, laboratory exercises / experiments

Assessment Methods:

Midterm examination, laboratory reports, final examination

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Pharmaceutics: The Science of Dosage Form Design, 4th edition	Michael Aulton, Kevin Taylor	Churchill Livingston, Elsevier	2013	9780702053931

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, 9th edition	Loyd V. Allen Jr., Nicholas G. Popovich, Howard C. Ansel	Lippincott Williams & Wilkins	2011	9780781779340