UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH-305	Pharmaceutical Technology II/ Φαρμακευτική Τεχνολογία II	6
Prerequisites	**Department**	**Semester**
IMPH-210	Health Sciences	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Required	Pharmacy	English
Level of Course	**Lecturer**	**Year of Study**
1st Cycle	Dr Maria Prapopoulou /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 non-sterile and sterile liquid and semi-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.
- Comprehend the need of assuring the sterility of specific dosage forms and how it can be achieved and maintained (e.g., perform pharmaceutical product sterilization and sterility testing, comply with Good Manufacturing Practices, GMPs)
- Obtain the necessary knowledge for developing sterile and non-sterile liquid and semi-solid dosage forms (e.g., parenteral and ophthalmic solutions, suspensions, gels), transdermal drug delivery systems and other dosage forms (e.g., foams, gels, microemulsions etc.), with the appropriate properties, through understanding their quality characteristics, the methodologies necessary for their production, the types and functions of excipients used, as well as the mechanisms of drug release and absorption.

Learning Outcomes:

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

- Identify the possible sources of pharmaceutical product microbial contamination and indicate prevention methods.
- Describe the sterilization methods, antimicrobial substances and sterility testing methods, most commonly used in the pharmaceutical industry and identify the selection criteria for each method / substance.
- Explain the basic elements of clean room design and operation according to GMPs, where the production of sterile dosage forms takes place.
- Recognize the characteristics, types and functions of excipients and containers used in parenteral, ophthalmic and transdermal drug delivery systems, as well as in pharmaceutical gels, foams and microemulsions.
- Understand the production methods and formulation parameters of the above-mentioned dosage forms.
- Identify the particularities of parenteral protein formulations.

Course Content:

Microbial contamination: sources of microbial contamination, sterility control, antimicrobial agents and processes.
Sterilization methods: basic principles, limitations, equipment used, validation of sterilization process
Parenteral and ophthalmic preparations: types, excipients used and their functions, formulation parameters, containers, quality controls.
Clean room design and operation.
Transdermal drug delivery systems: transdermal absorption, types and structure of transdermal patches, formulation parameters, methods used to increase transdermal absorption.
Gels, foams, microemulsions: types, properties, uses, formulation parameters, production methods
Protein delivery: formulation parameters, stability issues, excipients used and their role, microbial requirements.

Laboratory Exercises:

Exercise 1: Sterilization in laboratory autoclave and examination of probable sources of microbial contamination.

Exercise 2: Parenteral unit simulation.

Exercise 3: Medicated foams, preparation and quality control.

Exercise 4: Pharmaceutical gels: preparation and viscosity evaluation.

Learning Activities and Teaching Methods:

Lectures, class discussion, laboratory experiments/exercises

Assessment Methods:

Midterm examination, final examination, laboratory reports

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