UNIVERSITY OF PATRAS
SCHOOL OF HEALTH SCIENCES
DEPARTMENT OF PHARMACY
POSTGRADUATE PROGRAM: **DRUG DESIGN AND DEVELOPMENT**

COURSE TITLE: APPLIED PHARMACEUTICAL ANALYSIS AND CHARACTERISATION TECHNIQUES OF FINAL PRODUCTS

CODE: DPHA_B03

STATISTICS AND QUALITY MANAGEMENT IN PHARMACY
COURSE OUTLINE

1. GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF PHARMACY		
PARTICIPATING INSTITUTIONS	-		
TITLE of POSTGRADUATE PROGRAM	DRUG DESIGN AND DEVELOPMENT		
LEVEL	POSTGRADUATE		
COURSE CODE	**DPHA_B03**	**SEMESTER**	**B'**
COURSE TITLE	**APPLIED PHARMACEUTICAL ANALYSIS AND CHARACTERISATION TECHNIQUES OF FINAL PRODUCTS**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Courses	3	5

COURSE TYPE	Skills Development
PREREQUISITE COURSES	-
LANGUAGE of INSTRUCTION and EXAMINATIONS	Greek
COURSE OFFERED to ERASMUS STUDENTS	No
COUSRSE (URL)	http://www.pharmacy.upatras.gr/images/DS/DPHA_B03_EN.pdf

2. LEARNING OUTCOMES

Learning Outcomes
The student is introduced to the Spectroscopic techniques for characterization of pharmaceutical formulation: (NIR, IR-ATR, Raman, X-ray diffraction, microscopy (optical and scanning electron), Elemental Analysis Techniques (XRF, AAS, AES, ICP-MS, ICP-OES), Diffraction, Polarimetry, Particle Size Characterization Techniques, Thermal Analysis Techniques (TGA, DTA, DSC). Porosity measurement (BET). Specifically, upon successful completion of the course, the graduate student is expected to have developed level 7 skills in the following topics: Ability to select and use the Spectroscopic technique for the identification and quantification of the individual components of a liquid or solid sample of a pharmaceutical formulation.
General Competences
• Working independently • Team work • Search for, analysis and synthesis of data and information, with the use of the necessary technology

3. SYLLABUS

1. Validation of analytical methods. The concept of traceability. Good practice rules (GLP, GMP) and quality procedures in the pharmaceutical industry. Stability control of active substances and excipients.
2. Techniques for the determination of physical characteristics of substances:
3. Diffractometry- Principles, instrumentation, applications in Pharmaceutical Analysis,
4. Polarimetry- Principles, instrumentation, applications in Pharmaceutical Analysis,
5. Particle size characterization Principles, instrumentation, applications in Pharmaceutical Analysis.
6. Methods of thermal analysis (TGA, DTA, DSC).
7. Measurement of porosity (BET).
8. Microscopy (Optical and scanning electron).
9. Polymorphism of active substances in formulations: NIR, IR-ATR, Raman, X-ray diffraction, Microscopy (optical and electron). Examples.
10. Elemental analysis (XRF, AAS, AES, ICP-MS, ICP-OES)

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Physical presence of students/teachers in a lecture hall (face-to-face)
USE of INFORMATION and COMMUNICATIONS TECHNOLOGY	Learning process support through the e-class platform
TEACHING METHODS	***Activity*** ***Semester Workload*** Interactive teaching 39 Study and analysis of bibliography 47 Project 39 ***Course Total*** **(25 hours of work-load per ECTS credit) 125**
STUDENT PERFORMANCE EVALUATION	1. Written final examination (80%) including - Short development questions - Questions of a critical nature - Problem solving 2. Assignment - Presentation of an analytical problem from the international literature (20%)

5. RECOMMENDED BIBLIOGRAPHY

Related Bibliography

1. ΕΝΟΡΓΑΝΗ ΑΝΑΛΥΣΗ, ΘΕΜΙΣΤΟΚΛΗΣ Π. ΧΑΤΖΗΪΩΑΝΝΟΥ, ΜΙΧΑΗΛ Α. ΚΟΥΠΠΑΡΗΣ , 2014
2. ΕΝΟΡΓΑΝΗ ΧΗΜΙΚΗ ΑΝΑΛΥΣΗ, Ι. ΠΑΠΑΔΟΓΙΑΝΝΗΣ-Β. ΣΑΜΑΝΙΔΟΥ, 2η Έκδοση, Θεσσαλονίκη, 2011.
3. Φαρμακευτική ανάλυση, D.G. WATSON, , Επιμέλεια Ελληνικής 'Εκδοσης: Μ. Κουππάρης, Εκδόσεις Παρισιάνου, 2011.
4. ΘΕΜΕΛΙΩΔΕΙΣ ΑΡΧΕΣ ΑΝΑΛΥΤΙΚΗΣ ΧΗΜΕΙΑΣ, SKOOG, D. A. Skoog, D. M. West, F. James Holler, S. R. Crouch, Επιμέλεια Ελληνικής 'Εκδοσης: Μ. Ι. Καραγιάννης, Κ. Η. Ευσταθίου**,** Εκδόσεις Κωσταράκη, 2016