



UNIVERSITY OF
PATRAS
ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ

DEPARTMENT OF PHARMACY

SCHOOL OF HEALTH SCIENCES

UNIVERSITY OF PATRAS
SCHOOL OF HEALTH SCIENCES
DEPARTMENT OF PHARMACY
UNDERGRADUATE STUDIES' COURSES



COURSE DESCRIPTION: **APPLIED MATHEMATICS**
COURSE CODE: **PHA-A13-NEW**

**APPLIED MATHEMATICS
COURSE DESCRIPTION**

1. GENERAL

SCHOOL	HEALTH SCIENCES		
SEPARTMENT	PHARMACHY		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	PHA-A13-NEW	SEMESTER OF STUDIES	1st
COURSE TITLE	APPLIED MATHEMATICS		
INDEPENDENT TEACHING ACTIVITIES		TEACHING HOURS PER WEEK	ECTS CREDITS
Lectures		3	5
Tutorials		1	
COURSE TYPE	General Background Course		
PREREQUISITE COURSES:	-		
TEACHING AND ASSESSMENT LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Not offered		
COURSE WEBPAGE (URL)	http://www.pharmacy.upatras.gr/images/DS/PHA-A13-EN.pdf		

2. LEARNING OUTCOMES

Learning outcomes
<p>With this course a student will become familiar with several mathematical concepts such as derivatives (total and partial) and integrals (simple, multiple and improper). He/she will get some basic knowledge of Ordinary Differential Equations (ODEs). Besides, a student realizes that phenomena which are not deterministically predictable obey probabilistic models (distributions). He/she acquires the ability to construct (interpret) appropriate graphs and calculate statistics (such as sample mean and variance) in an effort, using the sample observations, to present statistical characteristics of a random phenomenon.</p> <p>On successful completion of the course a student will be able to use the above mentioned mathematical concepts to solve problems, to locate critical points of two-variable functions, to solve simple optimization problems, to solve simple ODEs problems. Moreover, he/she will be able to: understand the notions of sample and the population distribution; demonstrate ability to select a distributional model for a random phenomenon.</p>
General Abilities
<ul style="list-style-type: none"> • Adaptation to new situations • Decision making • Autonomous Work

- Work in an interdisciplinary environment
- Exercise of criticism and self-criticism
- Promotion of free, creative and inductive thinking

3. COURSE CONTENT

- Special functions: logarithmic, exponential, trigonometric and inverse trigonometric functions
- Improper integrals of the first and the second kind
- Functions in many variables: basic concepts, partial derivatives, double and triple integrals. Critical points and optimization methods
- Linear Algebra: Tables, determinants, systems of linear equations
- Ordinary Differential Equations (ODEs): Basic concepts and definitions, separable ODEs, exact ODEs, linear ODEs of first order, linear ODEs of second order with constant coefficients homogeneous and non-homogeneous
- Descriptive Statistics: graphical methods of data presentation, location and dispersion measures, sampling methods
- Elements of Probability Theory: definition of probability, events, conditional probability, independence, total probability theorem, Bayes' rule
- Random variables (discrete, continuous), commonly used distributions (binomial, hypergeometric, Poisson, exponential, normal), moments, central limit theorem

4. TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	Lectures (face to face)														
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	<ul style="list-style-type: none"> • In-class slides • Post-class support of the course via the web page of the Department of Mathematics 														
TEACHING ORGANIZATION	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Teaching Method</i></th> <th style="text-align: right;"><i>Semester Workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: right;">39</td> </tr> <tr> <td>Tutorials</td> <td style="text-align: right;">13</td> </tr> <tr> <td>Solving suggested exercises</td> <td style="text-align: right;">35</td> </tr> <tr> <td>Hours of personal study by the student</td> <td style="text-align: right;">35</td> </tr> <tr> <td>Final examination</td> <td style="text-align: right;">3</td> </tr> <tr> <td><i>Total number of hours for the Course (25 hours of work-load per ECTS credit)</i></td> <td style="text-align: right;">150</td> </tr> </tbody> </table>	<i>Teaching Method</i>	<i>Semester Workload</i>	Lectures	39	Tutorials	13	Solving suggested exercises	35	Hours of personal study by the student	35	Final examination	3	<i>Total number of hours for the Course (25 hours of work-load per ECTS credit)</i>	150
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STUDENT ASSESSMENT	Assessment Language: Greek Assessment Language for Erasmus students: English Assessment methods Final exams (100%) that includes ✓ Exercises Minimum passing grade: 5 Maximum passing grade: 10
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5. RECOMMENDED LITERATURE

(in Greek)

- FINNEY R.L., WEIR M.D., GIORDANO F.R. *ΑΠΕΙΡΟΣΤΙΚΟΣ ΛΟΓΙΣΜΟΣ*. ΙΔΡΥΜΑ ΤΕΧΝΟΛΟΓΙΑΣ & ΕΡΕΥΝΑΣ- ΠΑΝΕΠΙΣΤΗΜΙΑΚΕΣ ΕΚΔΟΣΕΙΣ ΚΡΗΤΗΣ, 2012
- Murray R. Spiegel. *Ανώτερα Μαθηματικά*, ΕΣΠΙ ΕΚΔΟΤΙΚΗ Εταιρεία Περιορισμένης Ευθύνης, 1982.
- Χαράλαμπος Γ. Ζαγούρας, Δημήτριος Ν. Γεωργίου. *ΓΕΝΙΚΑ ΜΑΘΗΜΑΤΙΚΑ II*, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ ΜΟΝ. ΕΠΕ, 2009.