MATHEMATICS IN PHARMACEUTICAL SCIENCES

Code number: NP18-1
Cycle: Undergraduate
Semester: 1st
Course type: Compulsory (Core)

X	Background/General knowledge
	Scientific area (pharmacy)

Credit Units (ECTS): 4
Lectures (hours/week): 3
Tutorial (hours/week):
Laboratory work (hours/week):
Course coordinator: Mpratsas Charalambos, RLT'S
Tutor (s): Mpratsas Charalambos, RLT'S

Assisting personnel: -

Aims of the course: Mathematics is a fundamental part of various fields and disciplines, and integral to attempts at understanding and solving problems not only in Exact Sciences, but also in Medical Science, Pharmacy, Social and Economic Sciences. The complexity of those problems often requires foundational knowledge of mathematical concepts and procedures. In addition to problem solving, mathematics provides essential skills in the evaluation of the relevant results and outcomes.

The course goal and learning objective is to give students the opportunity to deepen their mathematical understanding and to comprehend mathematical concepts and procedures, thus, to obtain better problem-solving skills in the field of Pharmacy. During the course, students will have the opportunity to align their interests with aspects of basic computational skills and quantitative reasoning. Upon completion of this course students will have reliably demonstrated the ability to use mathematical concepts and they will have incorporated a rewarding range of mathematical knowledge and skills.

The course topics are Matrix theory, Systems of Linear Equations, One-Variable Calculus, Integral Calculus of functions of a single variable, Differential Equations, as well as applications in the field of Pharmacy and Health Sciences.

Skills: The students familiarise themselves with the mathematical concepts and methods of the above topics and obtain the ability to use them, as a tool for understanding better subjects on their scientific area. Moreover, they develop the critical way of thinking and apply it in practice.

Teaching methods: Attending lectures, tutorial.

Contents of the course: Linear Algebra: Matrices - Determinants – Systems of linear equations.

Analytic Geometry in the plane: The straight line - The circle – The parabola - The ellipse - The hyperbola - The general equation of second degree - Translation of axes - Rotation of axes.

Analytic Geometry in the three - dimensional space: Equations of a line - The plane - The sphere.

Calculus: Derivative and differential of a function of one variable or two variables (Partial derivatives). Integration of functions

Ordinary differential equations of first order.

Proposed literature: 1) D. Demetropoulou-Psomopoulou. Elements of General Mathematics, 2nd edition, Ziti Pelagia & Sia Publications, Thessaloniki 1992.

2) P. Moisiadis. Higher Mathematics, 6th edition, A. and P. Christothoulidou Publications, Thessaloniki 2000.

3) T. Kiventithis. Higher Mathematics (volume I), 1st edition, Ziti Pelagia & Sia Publications, Thessaloniki 2005.

Lecture	Title	Tutor
1 - 2	Matrices – special matrices – actions – properties of matrices	Mpratsas
3 - 4	Elementary transformations of a matrix – equivalent matrices – rank of a matrix	Mpratsas
5 - 6	Determinants – inverse matrix	Mpratsas
7 - 8	Systems of linear equations	Mpratsas
9 - 10	Exercises on the previous chapter *	Mpratsas
11 - 12	Analytic Geometry in the plane: The straight line - The circle – The parabola - The ellipse - The hyperbola - The general equation of second degree - Translation of axes - Rotation of axes.	Mpratsas
13	Exercises on the previous chapter *	Mpratsas
14	Functions of one variable – Inverse functions - The Derivative - Formulas and methods of differentiation	Mpratsas
15 - 16	Differential of a function- Implicit differentiation - Higher order derivatives – Functions of two variables - Partial derivatives – The total differential	Mpratsas
17 - 18	Exercises on the previous chapter *	Mpratsas
19	The integral - Formulas and methods of integration	Mpratsas
20-21	Ordinary differential equations of first order	Mpratsas
22-23	Exercises on the two previous chapters *	Mpratsas

24-25	Analytic Geometry in the three - dimensional space: Equations of a line - The plane - The sphere.	Mpratsas
26	Exercises on the previous chapter *	Mpratsas

Educational activities: Lectures and tutorial

Evaluation process and methods: Written exam at the end of semester (2,5 h).

Use of ICTs (Information and Communication Technologies) / Electronic distribution of the lectures: -

Teaching:

Lectures and Tutorial*