UCLouvain

wsbim1001

2025

MATHEMATICAL METHODS IN BIOMEDICAL SCIENCES

5.00 credits	45.0 h + 20.0 h	Q2

Teacher(s)	Bieliavsky Pierre ;Robert Annie ;
Language :	French
Place of the course	Bruxelles Woluwe
Main themes	The course is intended for students with an elementary background in calculus as given in the basic course of physics in BAC1. It contains: -an introduction to linear algebra with emphasis on the computation of solutions to systems of linear equations, matrix algebra, eigenvalues, eigenvectors and diagonalization of matrices; -an introduction to the study of functions of several variables (partial derivatives, differentials, gradients, maxima and minima, Lagrange multipliers, multiple integrals) and systems of differential equations with a view on applications; -an introduction to analytical geometry, in particular to the equations and properties of straight lines, conics and quadrics; -a good deal of illustrations and applications to pharmacokinetics, chemical and enzymatic kinetics, genetics, statistics, themodynamics
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 The objective of this course is to introduce the students to the fundamental notions of linear algebra, calculus and analytical geometry in order to provide them with the basic mathematical tools essential for the biomedical sciences
Evaluation methods	The evaluation consists in a written examen graded on 20 points: a theoretical part (7 points), exercises (8 points), pharmacocinetics and statistic (5 points).
Teaching methods	Lectures and exercises sessions
Content	-Linear algebra : systems of linear algebraic equations, solution procedures by Gauss-Jordan elimination, matrix algebra, rank theory, inversion, eigenvalues, eigenvectors and diagonalization of matrices; -Complex numbers and periodic functions. Introduction to the theory of systems of ordinary differential equations -Applications to pharmacokinetics and statistics, thermodynamics.
Bibliography	livre conseillé: J. Stewart, Analyse. Concepts et contextes, Volume 2, Fonctions de plusieurs variables
Other infos	PREREQUISITE : Background in mathematics as given in the course of physics (BAC 1).
Faculty or entity in charge	SBIM

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Biomedicine	SBIM1BA	5		🔍