Course Syllabus

I. General Information

Course name	Mathematics with statistics in biology
Programme	Biotechnology
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BSc
Form of studies (full-time, part-time)	part-time
Discipline	Biological sciences
Language of instruction	English

Course coordinator/person responsible	dr Armen Grigoryan

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture	30	I, II	4
tutorial			
classes	30	I, II	
laboratory classes			
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Knowledge of basic mathematics at the secondary school level

II. Course Objectives

To acquaint the mathematical apparatus necessary for further education.
To familiarize students with the basic tools of higher mathematics.
To educate students of precise formulation of problems and their solutions.

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	The student has a basic knowledge of mathematics necessary for further education.	K_W02
W_02	The student has a basic knowledge of statistics necessary for describing and interpreting biotechnological processes.	K_W03
SKILLS		
U_01	The student can solve basic problems in mathematical analysis and linear algebra.	K_U17
U_02	The student is able to draw the correct inference on the basis of data from different sources.	K_U18

IV. Course Content

Semester 1.
Functions. Sequences and series of real numbers. The Fibonacci sequence and phyllotaxis. Limit of a function at a point. The derivative and its applications. Extrema of functions. Graphing. Indefinite integral. The Riemann definite integral and its applications. Matrices and determinants. Systems of linear equations.
Semester 2.
Introduction to the theory of probability. Random variable and its distribution. Descriptive statistics: frequency distribution, histogram, median and mode, expected value and standard deviation. Introduction to the theory of inference: estimation and tests of hypotheses. Elements of the statistical analysis of multidimensional measurements. Correlation and regression.

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
KNOWLEDGE			
W_01	Conventional lecture	I Semester, pass, II Semester exam	Evaluated test, protocol
W_02	Conventional lecture	I Semester, pass, II Semester exam	Evaluated test, protocol
SKILLS			
U_01	Practical classes	Test	Evaluated test, protocol
U_02	Practical classes	Test	Evaluated test, protocol

VI. Grading criteria, weighting factors.....

I Semester
Classes
Graded pass. 1 test – 100%
91% - 100% – 5.0
81% - 90% – 4,5
71% - 80% – 4,0
61% - 70% – 3,5
51% - 60% – 3,0
0% - 50% - 2,0
Lecture
Pass. 1 test – 100%
51% - 100 % passed
0% - 50% not passed

II Semester
Classes
Graded pass. 1 test – 100%
91% - 100% – 5.0
81% - 90% – 4,5
71% - 80% – 4,0
61% - 70% – 3,5
51% - 60% – 3,0
0% - 50% - 2,0
Lecture
Exam – 100%
91% - 100% – 5.0
81% - 90% – 4,5
71% - 80% – 4,0
61% - 70% – 3,5
51% - 60% – 3,0
0% - 50% - 2,0

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	60
Number of hours of individual student work	40

VIII. Literature

Basic literature
1. Edwards C.H., Penny D.E., Calculus with analytic geometry, Prentice Hall, NJ 1998. 2. Freund J.E., Statistics, Prentice - Halll, INC., New Jersey 1970. 3. Sincich T., Statistics by example, Dellen Publishing Company, Santa Clara, California 1982.
Additional literature
1. Zill D. G., Calculus with analytic geometry, PWS Publishers, Boston, 1985.