

# Mathematics (Horticulture+Landscape Design, Year I, Semester I)

**Credits (ECTS): 4**

## Course Category

Mandatory (Fundamental Discipline)

## Course Leader:

Lecturer **Emilian BULGARIU, PhD.**

## Course Objectives (course and seminar)

To familiarize students with the main types of problems and approaches in linear algebra and the application of mathematical concepts in economic and agricultural fields.

Mathematical modeling of practical problems frequently used in agricultural research and the understanding of probabilistic laws and optimization techniques.

Developing skills to use rigorous reasoning as well as individual study habits.

Forming a systemic understanding of the discipline and the mathematical apparatus.

## Programă analitică

Course
Elements of Abstract Algebra
Vector Spaces, linear dependence and independence, generating system, basis of a vector space, change of vector coordinates from one basis to another, substitution lemma, applications of the substitution lemma.
Linear Transformations, matrix associated with a linear transformation, kernel and image of a linear transformation, eigenvalues and eigenvectors.
Elements of Analytical Geometry
Elements of Linear Programming
Financial Mathematics
Elements of Probability Theory
Elements of Mathematical Statistics

Seminars
Matrices and Determinants. Operations with matrices. Determinants.
Systems of linear equations, Gauss method, Gauss-Jordan method, inverse of a matrix.
Independent linear system, dependent linear system, generating system, basis, change of coordinates of a vector from one basis to another.
Linear transformations, matrix associated with a linear transformation, kernel and image of a linear transformation, eigenvalues, and eigenvectors.
Analytical Geometry
Solving linear programming problems by graphic method.
Financial Mathematics
Events, operations, probabilities, conditional probabilities, total probability formula, Bayes' formula.

Classical Probability Schemes (Bernoulli, Poisson, Hypergeometric, Generalized Hypergeometric)
Random variables. Distribution function of a random variable. Numerical characteristics of random variables: mean, median, mode, quantiles, simple and centered moment, range, variance, standard deviation, Pearson coefficient of variability, Fisher coefficient of skewness, kurtosis and flattening coefficient.
Statistical series. Graphic representation of statistical series, absolute frequencies, relative frequencies, cumulative frequencies.
Regression method, correlation method.

## Bibliography

1. Chiruță C., *Elemente de matematică. Programare liniară și statistică matematică*, Editura „Ion Ionescu de la Brad” Iasi, 2019
2. Aldea Florica, *Matematici aplicate în științele agricole și silvice*, Editura Risoprint, Cluj Napoca, 2006.
3. Bunu I. coord. colectiv de autori, *Matematici economice*, Departamentul Editorial Poligrafic al Academiei de Studii Economice a Moldovei, Chișinău, 2012.
4. Burdujan I., *Elemente de algebră cu aplicații în biologie*, Ed. Pim, Iași, 2006.
5. Jaba Elisabeta, *Statistică* - ediția a doua - Editura Economică, București, 2000.
6. Jaba Elisabeta, *Statistică descriptivă - manual pentru învățământ deschis la distanță*, Ed. Univ. Al. I. Cuza, Iași, 2005

## Evaluation

Evaluation Method	Percentage of Final Grade	
Colloquium	Written Examination	60%
Continuous Assessment	Attendance at seminars, courses and verification tests during the semester.	40%

## Contact

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