Strada Transilvaniei, nr. 6, sector 1, București, ROMÂNIA
E-mail: fsi@unibuc.ro | Website: fsi.unibuc.ro

DISCIPLINE SHEET
Academic year 2025-2026

1. About the program

1.1 Higher education institution	University of Bucharest
1.2 Faculty	Faculty of Interdisciplinary Studies
1.3 Department	Interdisciplinary School of Doctoral Studies – ISDS-UB
1.4 Field of study	-
1.5 Study cycle	Doctorate
1.6 Study program / Qualification	***Broad Interdisciplinarity***

2. About the discipline

2.1 Name of the discipline				***Quantitative data analysis***			
2.2 Holder of the course				**Prof. Dr. Paul Vasos**			
2.3 Holder of the seminar				**Prof. Dr. Paul Vasos**			
2.4 Study year	I	2.5 Semester	II	2.6 Evaluation type	E	2.7 Discipline regime	

3. Total estimated time

3.1 Number of weekly hours		3.2 out of which course:		3.3 seminar/laboratory	
3.4 Total hours in the curriculum	20	.5 out of which course:	10	3.6 seminar/laboratory	10
Distribution of time:					**hours**
Study according to the textbook, course material, bibliography and notes					40
Additional documentation in the library, on specialized electronic platforms and in the field					30
Preparation of seminars/laboratory, assignments, papers, portfolios and essays					40
Tutoring					10
Examinations					10
Others……					

3.7. Total hours of individual study	**130**
3.8. Total hours per semester	**150**
3.9. Number of credits	**6**

4. Preconditions (where applicable)

4.1 curriculum	Mathemathics
4.2 skills	Calculations, Synthethic presentation, Basic programming or table-based calculations

5. Conditions (where applicable)

5.1 course delievery	Room with multimedia equipment (video projector, smart board)
5.2 conducting the seminar/laboratory	Room with multimedia equipment (video projector, smart board)

Strada Transilvaniei, nr. 6, sector 1, București, ROMÂNIA
E-mail: fsi@unibuc.ro | Website: fsi.unibuc.ro

6. Learning outcomes

Knowledge	LO1. Demonstrate understanding of the principles and strategies of effective scientific communication, including the ability to tailor messages to diverse audiences and platforms. They will be familiar with the conventions of academic writing, publishing processes, and the use of various communication tools in disseminating research findings. Data treatment, statistical analysis; broad knowledge and deep understading of research.
Skills	LO1. Demonstrate the capacity in various contexts to present and discuss research findings with the scientific community using clear and effective oral expression of evidence-based, analytical reasoning as well as to adapt the discussion depending on varied audience. LO2. Be able to clearly articulate complex ideas and research results both orally and in writing, create well-structured scientific documents, and present their work at conferences or in public forums. Demonstrate proficiency in using digital media and visual representations to enhance the impact of their communication
Responsibility and autonomy	LO1. Demonstrate ability to learn, adapt and work in varied intredisciplinary and multi-national environments; Analyse findings and perspectives found in other disciplines that contribute to improved understanding in their field.

7. Contents

8.1 Course	**Methods**	**Observations**
• Elements of statistical analysis: examples of variables and distributions in real life; • Operations on ensembles; Permutations; • Conditional probability; Bayes' theorem; • Statistics across different disciplines: from social sciences to medicine; • Distributions, fitting of functions; • Hypothesis tests, Z-scores;	Lecture, explanation,	5 hours
• Clinical trials - how they are conducted; • Omics: proteomics, metabolomics; Principal component analysis; • Techniques for quantitative spectroscopy: how to signal louder than the noise; data series: the example of Nuclear Magnetic Resonance. • Fitting data; Exponential and Gaussian functions;	Lecture, explanation, conversation	5 hours

References:

- Ajit Tamahe and Dorothy Dunlop, *Statistics and Data Analysis,* Pearson (2000)
- Sheldon Ross, A first course in probability, 10th edition (global edition), Pearson (2019)
- Richard J. Larsen, Morris L. Marx *An Introduction to Mathematical Statistics and Its Applications,* Pearson, fifth edition (2011)

Strada Transilvaniei, nr. 6, sector 1, București, ROMÂNIA
E-mail: fsi@unibuc.ro | Website: fsi.unibuc.ro

8.2 Seminar/laboratory	Methods	Observations
• Calculations in Excel: Matrices and Vectors • Probability calculations using decks of cards and dice; • Permutations, combinations; • Combined odds; • Calculations in Octave, Matlab: Matrix multiplication, function fitting • Probabilities in medical studies: the prevalence of medical conditions and imaging quality; • Evaluating Gaussian distributions using MsExcel (or equivalent freeware) and Matlab;	Student calculations and presentations, discussion	5 hours
• Examples of distributions, calculations of z-scores; • Discussion of an article of interest *in your field.*	Student calculations and presentations, discussion	5 hours
References Richard J. Larsen, Morris L. Marx *An Introduction to Mathematical Statistics and Its Applications,* Pearson (2011) David Morin *Probability for the Enthusiastic Beginner,* CreateSpace Independent Publishing Platform (2016)		

8. Correlating the content of the discipline with the expectations of representatives of the epistemic community, professional associations and representative employers in the field related to the program

Data analysis is used in most professional environments. Examples from various fields ranging from clinical studies to literature are provided in the course and seminar.

9. Assessment

Type of activity	Assessment criteria	Evaluation methods	Weight in the final grade
Course	Understanding, proactivity	Discussion	50 %
Seminar / laboratory	Presentation and calculation skills, understanding	Discussion, student presentations	50 %
Minimum performance standard	5/10 points		

Fill in date: 6.II.2026 Holder of the course Prof. Dr Paul Vasos

Director ISDS-UB,
Conf. Dr. Habil. Mihaela MATACHE