Obuda University John von Neumann Faculty of Informatics			Institute of Cyberphysical Systems	
Name and code: *Multivariate Statistical Methods* (*NMXTS1EMNF*), Credtis***: 4*** *Business Informatics MSc (English language)* *2026/27 academic year, fall semester*				
Lecturers: Szabolcs Baják PhD				
Prerequisites (with code):				
Weekly hours:	Lecture: 2	Seminar.: 2	Lab. hours: 0	Consultation: 0
Way of assessment:	Practice tests & Theoretical exam			
Course description:				
Goal: To familiarize the students with the basics of multivariate statistics, both with the theoretical foundations and the most important applications.				
Course description: Univariate statistical inference, point estimators, statistical intervals, hypotheses testing. Statistical inference for two samples. Simple linear regression and Correlation. Multiple linear regression. Analysis of Variance. Design of Experiments with Several Factors.				

Lecture schedule	
Week of education	*Topic*
1.	Review of univariate probability theory
2.	Review of descriptive statistics and univariate statistical inference. Point estimations of parameters. Statistical intervals.
3.	Review of tests of hypotheses for a single sample.
4.	Statistical inference for two samples I
5.	Statistical inference for two samples II
6.	Simple linear regression and Correlation I
7.	Simple linear regression and Correlation II
8.	Multiple linear regression I
9.	Multiple linear regression II
10.	Design and Analysis of Single-factor Experiments: The Analysis of Variance.
11.	The Analysis of Variance.
12.	Design of Experiments with Several Factors.
13.	Practical test.
14.	Test retake (if needed)

Midterm requirements

During the semester, the theoretical and the practical parts will not be divided sharply in the classes, therefore attending the lecture is strongly recommended for a better understanding.

The practice test will be organized during class on Week 13, at least 50 % is needed to pass. A retake opportunity, if needed, will be on Week 14. The practice test has to be passed to attend the final exam.

2026. 06. 24.

Final grade calculation methods

The final grade is formed from the practice grade and the exam grade.
Final grade = 0.5*practice grade + 0.5*exam (in percentages)
A minimum of 50% must be achieved at each part.
The calculation of the final grade:

Achieved result	Grade
89%-100%	excellent (5)
76%-88<%	good (4)
63%-75<%	average (3)
50%-62<%	satisfactory (2)
0%-50<%	failed (1)

Type of exam

Written and oral exam.

Type of replacement

One opportunity in the exam period (for the practical test).

References

Obligatory:

- Notes in the Moodle course.
- D. C. Montgomery – G. C. Runger: Applied statistics and Probability for Engineers. 7th ed. John Wiley & Sons, 2018.

Recommended:

- B Flury: A First Course in Multivariate Statistics, Springer, 1997.
- W. K. Haerdle, L. Simar: Applied Multivariate Statistical Analysis, Springer, 2015.
- C. R. Rao: Linear statistical inference and its applications, Wiley and Sons, 1968.