

**The Technical University of Košice, Faculty of Mechanical Engineering**

Course unit title: **MATHEMATICS IV.**  
 Study programme: **Mechanical Engineering  
 Mechatronics**

Study period: **2nd year, ST 2019/2020**  
 Faculty: **Faculty of Mechanical Engineering**  
 Level of study: **Bachelor**  
 Form of study: **Full time**  
 Evaluation: **Graded credit test**  
 Number of credits: **4**

Guaranteeing department: **DEPARTMENT OF APPLIED MATHEMATICS AND INFORMATICS**  
 Guarantor: **prof. RNDr. Martin BAČA, CSc.**

<b>Week</b>	<b>Lectures Number of hours: 2 per week</b>	<b>Tutorials Number of hours: 2 per week</b>
1.	Combinatorics. Random events and random variables. The conditional probability. Total probability.	Combinatorics. Total probability.
2.	The random variable. Distribution function. Numerical characteristics of random variables.	The random variable. Distribution function. Numerical characteristics of random variables.
3.	Selected distributions of discrete random variables.	Selected distributions of discrete random variables.
4.	Selected distributions of continuous random variables.	Selected distributions of continuous random variables.
5.	Descriptive statistics - basic statistical concepts. Statistical classification. Numerical characteristics of the statistical file.	The determination of the number of classes. Numerical characteristics of the statistical file.
6.	Graphic representation of the statistical file. The theory of the estimation.	Graphic representation of the statistical file. The point and interval estimations of the parameters of the basic population.
7.	Testing of hypotheses. Basic terms of testing of hypotheses. One-sample hypothesis tests.	<i>Test.</i>
8.	Two-samples hypothesis tests. Tests of extreme values.	One-sample hypothesis tests.
9.	Tests of the good compliance (Pearson test, Kolmogorov test).	Two-samples hypothesis tests. Tests of extreme values.
10.	Tests of the good compliance (Kolmogorov-Smirnov test). Regression analysis. Linear regression.	Tests of the good compliance (Pearson test, Kolmogorov test).
11.	Nonlinear regression.	Tests of the good compliance (Kolmogorov-Smirnov test). Linear regression.
12.	Correlation analysis.	Nonlinear regression. Correlation analysis.
13.	Spearman's rank correlation coefficient. Multiple regression.	<i>Test.</i>

**Recommended reading:**

1. Hines, W.W., Montgomery, D.C.: Probability and Statistics in Engineering and Management Science, John Wiley & Sons, New York, 1990.
2. Knežo, D., Andrejiová, M., Ižariková, G.: Základné štatistické metódy, TU, SJF, Košice, 2011 (in Slovak).
3. McClave, J.T., Benson, P.G.: Statistics for Business and Economics, Dellen Publ. Company, San Francisco, 1985.
4. Morrison, S.J.: Statistics for Engineers: an Introduction, Wiley, Chichester, 2009.

**Evaluation:****EVALUATION**

1st test: **50 points**

2nd test: **50 points**

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Graded credit test: **total points 100, required minimum 51**

**The necessary condition for obtaining a course credit is to write down homework assignments.**

**Attendance of lectures and classes is compulsory.**

Košice, 7th February, 2020

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Signature of guarantee

*You can find these information on webpage*

<http://www.sjf.tuke.sk/kamai/vyucba/predmety-v-letnom-semestri/sjf-ls>