Course unit title:	**NUMERICAL METHODS**
Course code:	**23005207**
Study programme:	**Automotive Production**
	Mechanical Engineering

Study period:	**2st year, WT 2021/2022**
Faculty:	**Faculty of Mechanical Engineering**
Level of study:	**Bachelor**
Form of study:	**Full time**
Evaluation:	**Graded credit test**
Number of credits:	**2**

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

Week	Lectures Number of hours: 0 per week	Tutorials Number of hours: 2 per week
1.		Introduction to numerical methods.
2.		Graphical solution of equation $f(x) = 0$. The halving method.
3.		Method of chords. Newton's method. The method of iteration.
4.		Solving systems of linear equations. The method of iteration. The Seidel method.
5.		Lagrange's interpolation formula. Lagrangian coefficients. Newton's interpolation formula. Inverse interpolation.
6.		Approximation of functions. The least squares method. Linear approximation.
7.		*Test.*
8.		The least squares method. Non-linear approximations.
9.		The trapezoidal formula.
10.		Simpson's formula. Richardson extrapolation.
11.		Numerical methods for approximating the solution to differential equations. Euler's method.
12.		The fourth order Runge-Kutta method to solve differential equations.
13.		*Test.*

Recommended reading:

1. Chapra, S., Canale, R.: Numerical methods for engineers, McGraw-Hill, 2010.

2. Yang, X.S.: Introduction to computational mathematics. World Scientific, 2008.

3. Strang, G.: Computational science and engineering. Wiley, 2007.

4. Pav, S.E.: Numerical methods course notes, University of California at San Diego, 2005.

5. Hämmerlin, G., Hoffmann, K.H.: Numerical mathematics, Springer-Verlag, New York, 1991.

Evaluation:

EVALUATION

1st test:	**40 points**
2nd test:	**40 points**
Homework assignments:	**20 points**
G r a d e d c r e d i t t e s t:	**total points 100, required minimum 51**

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

Attendance of classes is compulsory.

Košice, 17th September, 2021

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Signature of guarantee

You can find these information on webpage
http://www.sjf.tuke.sk/kamai/students/syllabi