DESCRIPTION OF A STUDY COURSE – SYLLABUS

<table>
<tr><td>Title of a course</td><td colspan="5">Mathematics</td></tr>
<tr><td>Head of course</td><td colspan="5">MSc Mirjana Rakamarić Grlica, Senior Lecturer</td></tr>
<tr><td>Study programme</td><td colspan="5">Professional undergraduate study Telematics</td></tr>
<tr><td>Status of a course</td><td colspan="5">Obligatory</td></tr>
<tr><td>Year of study</td><td>1.</td><td>Semester</td><td>I</td><td>ECTS credits</td><td>8</td></tr>
<tr><td>Teaching plan
(L + E + S+ Pr)</td><td colspan="5">3L+4E</td></tr>
<tr><td colspan="6">Goals of a course</td></tr>
<tr><td colspan="6">Introduce students to the basic concepts of linear algebra, the function of a single variable and the infinitesimal calculus. Prepare students for their application.</td></tr>
<tr><td colspan="6">Conditions for enrolling course</td></tr>
<tr><td colspan="6">No conditions</td></tr>
<tr><td colspan="6">Learning outcomes on a level of a study programme which includes course</td></tr>
<tr><td colspan="6">Outcome 1: Explain the basic mathematical, physical and technical principles of operation of electrotechnical, electronic and computer elements and circuits, measuring devices and electrical machines used in telematics systems.
Outcome 2: Link mathematical methods, engineering principles and computer simulations from the signal and system theory with applications in telematics systems.</td></tr>
<tr><td colspan="6">Expected learning outcomes on a level of a course</td></tr>
<tr><td colspan="6">1. Apply the basics of mathematical analysis to a single variable function.
2. Solve problems from infinitesimal calculus.
3. Solve problems from the basics of linear algebra.
4. Explain concepts from the basics of mathematical analysis and the basics of linear algebra.</td></tr>
<tr><td colspan="6">Content of a course</td></tr>
<tr><td colspan="6">Revising and determining the basics of Mathematics. Determining previous knowledge. Term, the way of giving and some forms of functions. The domain of a function. Function composition. Inverse function. Classification of functions. Basic functions. Graphical display and features of some elementary functions. The examples of using elementary functions in telematics. Polynomials. Polynomial factorization and determining null points. Fractional rational functions, domain, null points, asymptotes. Equations/ Inequations, linear, quadratic, nth degree equations. The term matrix and some special types of matrices. Operations with matrices. Determinants. Features of determinants. Calculating the value of a determinant. The rank of a matrix. Invertible matrix. Matrix equations. Fractional rational functions. Vector spaces. Vector module, direction and orientation. Adding and subtracting vectors and scalar multiplication. A display of vectors using coordinates. Scalar and vector product. Linear dependence and independence of vectors The application of a vector calculus at alternating current. The term row. Limit of a sequence. Convergence and divergence, types of sequences. Limit of a function. Term and definition of a derivation in a point exemplified by the tangent (Leibnitz) and a problem of a current velocity (Newton). A derivative of certain table derivatives. Basic rules for derivation. Techniques of derivation using table derivatives (simple derivatives). Derivatives of a complex function. Logarithm derivation. Extremes and optimum. Solving the limit by using derivations – L 'Hospital's rule. Integral calculus. The application of a differential calculus in telematics. The Laplace transformation and the application in system modelling.</td></tr>
<tr><td>Teaching modes</td><td colspan="2">☒ lectures
☐ auditory exercises
☒ seminars and workshops
☐ distance learning
☐ field classes</td><td colspan="3">☒ individual assignments
☐ multimedia and network
☐ laboratory
☐ supervisor's work
☐ other _____</td></tr>
<tr><td>Comments</td><td colspan="5"></td></tr>
<tr><td colspan="6">Students' obligations</td></tr>
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Grading, evaluation and monitoring of students' work continuously during lectures and exams

Grading is based upon evaluation of course's learning outcomes' adoption. Grading is performed continuously during lectures and/or during exam, in compliance with the provisions of Regulation on the assessment of students.

Continuous check-up:

Outcomes	Pre-exam 1	Pre-exam 2	Test 1	Test 2	Home assignment	Threshold	Max
Outcome 1	22 %					11 %	22 %
Outcome 2	6 %	12 %			6 %	12 %	24 %
Outcome 3		20 %			4 %	12 %	24 %
Outcome 4			10 %	20 %		15 %	30 %
Percentage of ECTS	3,24	2,56	0,8	1,6	0,8		
Total	28 %	32 %	10 %	20 %	10 %	50 %	100 %

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Exam term:

Outcomes	Written exam	Oral exam	Max
Outcome 1	22 %		22 %
Outcome 2	24 %		24 %
Outcome 3	24 %		24 %
Outcome 4		30 %	30%
Percentage of ECTS	5,6	2,4	8
Total	70 %	30 %	100 %

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Grading:

A student has passed the exam if he has acquired at least 50% of anticipated credits of a specific learning outcome.

If a student has passed learning outcomes of all courses, the accomplished credits (percentages) of all passed learning outcomes are being added, while the final grade is defined upon following table:

Range of credits (percentages)	Numerical grade	ECTS grade
90,00 – 100,00	Excellent (5)	A
75,00 – 89,99	Very good (4)	B
60,00 – 74,99	Good (3)	C
50,00 – 59,99	Sufficient (2)	D
0,00 – 49,99	Insufficient (1)	F

Obligatory literature

1. Štambuk Lj. : Poslovna matematika 1, Karlovac, 2006.
2. Mirta Mataija, Maja Gligora M., Mirjana Rakamarić Š.: Matematika - Zbirka ispitnih zadataka

Additional literature

1. Dobrosavljević, Glavan i ostali : Matematika I, Pomorski fakultet u Rijeci
2. Minorski: Zbirka zadataka više matematike
3. Other textbooks and collections covering the topics covered in the course.