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| Study program: Information Technology | | | |
| Course title: MATHEMATICS 1 | | | |
| Teacher(s): Nada Ž. Damljanović, Dragan Ž. Đurčić | | | |
| Course status: mandatory | | | |
| ECTS: 6 | | | |
| Prerequisite courses: none | | | |
| Course objectives Enabling students to develop abstract thinking and acquire fundamental knowledge of linear algebra and mathematical analysis. | | | |
| Learning outcomes At the end of the course, students would master basic mathematical ideas, concepts and results, and they would be able to apply practically their knowledge within the same or within some other scientific fields and subjects. | | | |
| Content of the course <i>Theoretical teaching</i> Language of mathematics, notions, notations, formulas and techniques of proving, sets, relations, functions, field of real numbers, field of complex numbers, matrices, addition and multiplication of matrices, determinants, properties of determinants, determinants of higher order, inverse matrix, rank of matrices, systems of linear equations, Gaussian methods of elimination, Cramer's rule, systems of linear equations with parameters, matrix method for solving systems of linear equations, vectors in the Cartesian coordinate system, scalar product, vector product, mixed product, point, distance between two points, plane, canonical equation of plane, plane through three points, segment form of the equation of plane, the normal form of the equation of plane, distance from point to plane, mutual relationship between two planes, straight line, the canonical equation of line, line through two distinct points, mutual relationship between lines, distance between point and line, mutual relationship between line and plane, sequences, limit of a sequence, Cauchy sequences, monotonic sequences, limit of function, continuity of functions, derivative of the function, the basic rules for the first derivative of the function, differentiable functions, geometric interpretation of derivative, chain rule, implicit differentiation, inverse functions and differentiation, differentiation of functions in parametric form, derivatives of higher order, applications, monotony and extreme value of the function, the mean value theorem, concavity of functions graphics, L'Hospital's rule, examination of functions, various tasks with the application of derivatives. <i>Practical teaching</i> Solving concrete problems, examples and exercises based on exposed theoretical concepts and principles. | | | |
| Literature [1] E.J. Herman, G. Strang, Calculus Volume 1, OpenStax, 2016, e-ISSN: 978-1-947172-13-5, https://openstax.org/details/books/calculus-volume-1 [2] Stevanović, M. (2006). Matematika 1, Tehnički Fakultet Čačak, ISBN - 86-7776-034-2. [3] Miličić, P., Ušćumlić, M. (1973). Zbirka zadataka iz više matematike 1, Nauka, Beograd. [4] Žižović, M. (1998). Matematika, ICIM, Kruševac. | | | |
| Number of active teaching classes: 6 | | Theoretical teaching: 3 | Practical teaching: 3 |
| Teaching methods The lectures are performed using classical methods of teaching in combination with video projector and active interaction with students. Knowledge of students is tested by homework, colloquium, and final exam (written and oral). At the final, a comprehensive understanding of the exposed material is checked. | | | |
| Evaluation of knowledge (maximum number of points 100) | | | |
| Pre-exam obligations | Points | Final exam | Points |
| Activity during theoretical classes | 3 | Final exam (written): | 35 |
| Activity during practical classes | 3 | Final exam (oral): | 25 |
| Colloquium | 30 | | |
| Homework | 4 | | |