



SYLLABUS

| Basic information of the course | |
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| University: | University “Ukshin Hoti” - Prizren |
| Academic unit: | Faculty of Computer Science |
| Study program: | Information and Telecommunication Technologies |
| Course: | Mathematics II |
| Study level: | Bachelor |
| Course status: | Mandatory |
| Study year: | 1 |
| Number of hours per week: | 2+2 |
| Credit value - ECTS: | 6 |
| Time / location: | It will be published in the university web site! |
| Lecturers: | Assoc. Prof. Dr. Ismet Temaj Ass. Rigon Sallauka, Ph. D. c. |
| Contact details: | ismet.temaj@uni-prizren.com rigonsallauka@gmail.com |
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| Course description: | <p>This course will cover the elements of linear algebra, such as systems of linear equations, the theory of matrices and determinants, and their application to the solution of systems of linear equations. Different operations with matrices and their properties will be defined as well as different types of matrices. The definition of the determinant of the order n will be given, the properties of the determinants are learned and their application in calculating the value of the determinant. This knowledge applies to the solution of systems of linear equations (matrix form of the system; Kramer's formulas for solving quadratic systems of linear equations; Gauss's method as well as the Kronecker-Kapel theorem for solving systems). The basic concepts from vector spaces will be given. Inner products, orthonormal bases, and linear transformations will be discussed.</p> <p>During the course importance is given to the study of some elements of analytical geometry. The elements of vector algebra are studied (addition and subtraction of vectors, scalar product of two vectors, mixed product of three vectors). This knowledge is</p> |

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| | used to introduce coordinate systems in line, plane and space. Finally, the theory of first degree lines (straight lines in plane and space) will be studied. |
| Course objectives: | Introducing to students the basic concepts and ideas of linear algebra and analytic geometry and their application to other mathematical disciplines. |
| Learning outcomes: | After successfully completing these course students will be able to: <ul style="list-style-type: none"> - Easily use the mathematics notions from this course to other courses and in solving real life problems. - Apply the notions from this course to convert different economics or financial problems into a mathematical problem (model), solve them mathematically, and economically or financially interpret the obtained solutions. - Apply the mathematical tools form this course to analyzing the complexity of a given algorithm. - Analyze different cases of a given real life problem, so they can find an optimal solution to it. - Clearly express their mathematical ideas orally and in a written form. |

| Contribution on student load (must correspond with learning outcomes) | | | |
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| Activity | Hours | Days/week | Total/hours |
| Lectures | 2 | 15 | 30 |
| Exercise theoretical/laboratory | 2 | 15 | 30 |
| Practice work | - | - | - |
| Contact with lecturer/consultations | 1 | 4 | 4 |
| Field exercises | - | - | - |
| Midterms | 6 | 2 | 12 |
| Laboratory exercises | 5 | 1 | 5 |
| Individual time spent studying (at the library or home) | | | 50 |
| Final preparation for the exam | 15 | 1 | 15 |
| Time spent in evaluation (tests, quiz, final exam) | 2 | 2 | 4 |
| Projects, presentations, etc. | - | - | - |
| Total | | | 150 |

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| <p>Notice: 1 ECTS credits = 25 hours commitment, e.g. if the course has 6 ECTS credits student must have 150 hours during the semester.</p> | |
| <p>Teaching methods:</p> | <p>The course is a combination of lectures, discussions, numerical and laboratory exercises, while the assignments are presented by the laboratory course lecturers!</p> |
| <p>Assessment methods:</p> | <ul style="list-style-type: none"> - Periodic tests. - Homework and seminar work. - Activity. - Final exam. <p>Periodic tests Two tests, each with maximum points 60; Exams are in writing.</p> <p>Homework and seminar work There will be two homework problems (which will be evaluated), one in the period before the first test and one before the second test. They will be problems of the same type as those to be done in exercises. The deadline for submission will be one week. The maximum number of points for each problem is 10 points. Problems are not mandatory. Those who do not choose will have zero points.</p> <p>Activity During exercises regularly, and in lectures occasionally will be given problems to solve independently. Students who are successful in solving these problems receive 5 points for each problem. The maximum number of points that can be collected in this section is 20. With 10 points collected, students will have the option of exemption from the final exam.</p> <p>Final exam The exam is oral; verifies the understanding of the content discussed in the lectures. The requirement to enter the final exam is a total of at least 50 points collected in two tests, homework and classroom activities. The maximum number of points possible to get to the</p> |

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| | <p>final exam is 40 points. Students who through classroom activities collect at least 10 points are not required to enter the final exam, but can take grades based on two periodic tests, tasks and classroom activity.</p> <p>Improvement Exam Improvement of points can be done mostly in one of the tests or the final exam. After the second test, students can choose which test they want to improve their score. Students who are not satisfied with the outcome of the final exam and who have not been subjected to the corrective test as above may enter the final exam test. This test will be at the same time the final exam for students who have requested an upgrade test in one of the two periodic tests.</p> <p>Final grade Points will be collected from the first test (max 60 points), the second test (max 60 points), the homework (max 20 points), the classroom activity (max 20 points) and the final exam (max 40 points). (Students who are exempt from the final exam will only collect points from the first four components.</p> | |
| Assessment and grading: | Vlerësimi në % | Nota përfundimtare |
| | 91% - 100% | 10 |
| | 81% - 90% | 9 |
| | 71% - 80% | 8 |
| | 61% - 70% | 7 |
| | 51% - 60% | 6 |
| | 0% - 50% | 5 |
| Literature | | |
| Basic literature: | <ol style="list-style-type: none"> 1. G. Strang, Introduction to Linear Algebra, 4th ed. Wellesley, MA; Wellesley-Cambridge Press, 2009. 2. K.H. Bllaca: Matematika I (shënimet e ligjëratave). 3. Isak Hoxha - Matematika I 4. Ejup Hamiti – Matematika I | |
| Additional literature: | <ol style="list-style-type: none"> 1. Terry H. Wesner, Harry L. Nustad: Intermediate Algebra with applications, WCB Group 1991. 2. E. Gashi, Algjebra I, Universiteti i Prishtinës, | |

| | Prishtinë, 2001. |
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| Study plan | |
| Week | Lectures |
| <i>First week:</i> | <ul style="list-style-type: none"> Introducing the syllabus of the course to the students and informing them for all academic procedures. |
| <i>Second week:</i> | <ul style="list-style-type: none"> Matrices and types of matrices |
| <i>Third week:</i> | <ul style="list-style-type: none"> Determinants and their properties |
| <i>Fourth week:</i> | <ul style="list-style-type: none"> Determinants of high order. Laplace theorem |
| <i>Fifth week:</i> | <ul style="list-style-type: none"> Inverse matrix |
| <i>Sixth week:</i> | <ul style="list-style-type: none"> Matrix rank |
| <i>Seventh week:</i> | <ul style="list-style-type: none"> First test |
| <i>Eighth week:</i> | <ul style="list-style-type: none"> Systems of linear equations |
| <i>Ninth week:</i> | <ul style="list-style-type: none"> Methods for solving systems of linear equations. |
| <i>Tenth week:</i> | <ul style="list-style-type: none"> Systems of linear equations |
| <i>Eleventh week:</i> | <ul style="list-style-type: none"> The Kronecker-Capelli theorem and its application |
| <i>Twelfth week:</i> | <ul style="list-style-type: none"> Vectors |
| <i>Thirteenth week:</i> | <ul style="list-style-type: none"> Addition and subtraction of vectors. Vector projection |
| <i>Fourteenth week:</i> | <ul style="list-style-type: none"> Scalar, vector and mixed product of vectors |
| <i>Fifteenth week:</i> | <ul style="list-style-type: none"> Second test |

Exercises

| Study plan | |
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| Java | Exercises |
| <i>First week:</i> | <ul style="list-style-type: none"> Introducing the syllabus of the course to the students and informing them for all academic procedures. |
| <i>Second week:</i> | <ul style="list-style-type: none"> Matrices and types of matrices |
| <i>Third week:</i> | <ul style="list-style-type: none"> Determinants and their properties |
| <i>Fourth week:</i> | <ul style="list-style-type: none"> Determinants of high order. Laplace theorem |
| <i>Fifth week:</i> | <ul style="list-style-type: none"> Inverse matrix |
| <i>Sixth week:</i> | <ul style="list-style-type: none"> Matrix rank |
| <i>Seventh week:</i> | <ul style="list-style-type: none"> First test |
| <i>Eighth week:</i> | <ul style="list-style-type: none"> Systems of linear equations |
| <i>Ninth week:</i> | <ul style="list-style-type: none"> Methods for solving systems of linear equations. |
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| <i>Fourteenth week:</i> | <ul style="list-style-type: none"> Scalar, vector and mixed product of vectors |
| <i>Fifteenth week:</i> | <ul style="list-style-type: none"> Second test |

Academic policies and rules of conduct

- Generally lecture presentations will be made through MS PowerPoint, tables, material usage, computer programs and numeric exercises.
- Additional resources (scientific papers, publications, national bulletins, as well as recent discoveries and research) will be provided by professors.
- In the absence of the opportunity for practical work to be organized weekly, in cooperation with the management of the university, this activity will be organized on certain days in: organizations, companies, etc.
- During each session will be organized the conversation and co-participation with the students!
- Students are required to be regular in lectures and exercises!
- It will be evaluated when the students collaborate and participate in the lectures and course exercises!
- Timely arrival in lectures and exercises is mandatory!