Tantárgy: Linear Algebra

Törzslap

Tantárgy kódja: 4MA12NAK59B

A tantárgy megnevezése (magyarul): Linear Algebra

A tantárgy megnevezése (angolul): Linear Algebra

Kreditérték: 4

A tantárgyfelelős neve: Dr. Magyarkuti Gyula

Tantárgyfelelős szervezeti egység: Matematika Tanszék

Angol Verzió

Tantárgyi adatlap

Adatlap nyelve: Angol

Oktatás nyelve: Angol

A tantárgy célja: Solve systems of linear equations using various methods including Gauss-Jordan elimination and inverse matrices.
Perform matrix algebra, invertibility, and the transpose and understand vector algebra in R^n.
Determine relationship between coefficient matrix invertibility and solutions to a system of linear equations and the inverse matrices.
Define special matrices: diagonal, triangular, and symmetric
Understand determinants and their properties.
Understand real vector spaces and subspaces and apply their properties.
Understand linear independence and dependence.
Find basis and dimension of a vector space,and understand change of basis.
Find a basis for the row space, column space and null space of a matrix and find the rank and nullity of a matrix.
Compute linear transformations, kernel and range, and inverse linear transformations, and find matrices of general linear transformations.
Find the dimension of spaces such as those associated with matrices and linear transformations.
Find eigenvalues and eigenvectors and use them in applications.
Diagonalize, and orthogonally diagonalize symmetric matrices.
Evaluate the dot product, norm, angle between vectors, and orthogonality of two vectors in R^n.
Compute inner products on a real vector space and compute angle and orthogonality in inner product spaces.
Create orthogonal and orthonormal bases: Gram-Schmidt process and use bases and orthonormal bases to solve application problems.
Prove basic results in linear algebra using appropriate proof-writing techniques such as linear independence of vectors; properties of subspaces; linearity, injectivity and surjectivity of functions; and properties of eigenvectors and eigenvalues.
Spectral theorem of symmetric matrices

Tantárgy: Linear Algebra

Quadratic forms, Definiteness of Quadratic forms using Gaussian elimination.

Fenntarthatóság: N

Kapcsolat: Microeconomy, Macroeconomy, Operation research, Computer technology.

A tanóra száma: 2 lectures 2 seminars per week

Meghirdetés gyakorisága: Fall

Előtanulmányi kötelezettségek: Calculus, Probability Theory.

Az értékelés módszere: Written exams.

Beviteli mód: 1

Típus: core

Órarendi beosztás: Monday 11.40
Monday 13.40
Monday 17.20
See the details in Neptun.

Tanulási eredmények

A szakmai kompetenciák - tudás:To learn basic techniques of Calculus, including differentiation and integration.

A szakmai kompetenciák - képesség:To learn basic ideas of mathematical thinking.

A szakmai kompetenciák - attitűd:Understanding the concept of the art of deductive reasoning.

A szakmai kompetenciák - autonómia és felelősség:N

Tanulási tevékenység

Tevékenység:For a full and deep understanding, the regular attendance of classes is absolutely inevitable! Homework assignments are profoundly important.

Munkaterhelés:5

Megfontolások:The webpage of the Linear Algebra course:
https://magyarkuti.github.io/linear-algebra/

Értékelés

Tanulási tevékenység:1. The Office Hours is in S 208/b at Monday 6.00pm. Registration via e-mail is required not later than 7 pm of the actual day before.

2. Attendance is compulsory in the classes.

3. The exact date of the Mini Quizzes are as follows:
3/1, Week 3: 26 September,
3/2, Week 6: 17 October,
3/3, Week 9: 14 November,
3/4. Week 12: 5 December.

4. The expected date of the Final Exam is: 20 or 21 of December.

5. No reschedule or makeup of the midterm quizzes.

6. Grading: You will receive 5-5 points at maximum for your 4 Mini quizzes and 30 points for the Final exam. Thus 50 points can be collected. 20 points is the limit to not to fail.

7. Those students who do not pass this way, may take any of the (repeat) exams, and must carry the scores of the mini quizzes. The maximum score in a repeat exam is 30 points and the above grading applies.

8. The same rules and conditions apply to students who retake this course.

9. All rules and conditions are regulated by the University Code of Study and Exams.
See: http://portal.uni-corvinus.hu/fileadmin/user_upload/hu/kozponti_szervezeti_egysegek/nemzetkozi_iroda/files/Regulations_NEW_NEW/TVSZ/III_1_TVSZ_2017_december_19.pdf

10. Handouts compiled by the instructor are available at http://magyarkuti.github.io/linear-algebra

Szempontok:Grading is based on the total score and is given in the table below.
below 40% 1
40-54% 2
55-69% 3
70-84% 4
85% or above 5

Kötelező és ajánlott irodalom

Kötelező irodalom:See: https://magyarkuti.github.io/linear-algebra/
and
http://web.uni-corvinus.hu/~tallos/EMat.pdf

Ajánlott irodalom:K. Sydsaeter, P. Hammond: Mathematics for Economic Analysis, Prentice Hall, 2005 or newer editions

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https://www.math.ucdavis.edu/~linear/linear-guest.pdf

Kötelező irodalom elérhetősége az Egyetemi Könyvtárban

K. Sydsaeter, P. Hammond: Mathematics for Economic Analysis, Prentice Hall, 2005 or newer editions

Peter Tallos, Lectures on Mathematics