|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Details | | | | | | | | | | | | | | | | | | | |
| Code | | | | | | | | | | | | | | **Academic Year** | | | | | **Semester** |
| BE013 | | | | | | | | | | | | | | 2021-2022 | | | | |  |
| Title | | | | | | | | | | | | | | **T** | **A** | | **L** | | **ECTS** |
| Linear Algebra | | | | | | | | | | | | | | 3 | 1 | | 0 | | 10 |
|  | | | | | | | | | | | | | | | | | | | |
| Language | | | | | English | | | | | | | | | | | | | | |
| Level | | | | | **Master** |  | | | **Doctorate** | | | **X** | | | | | | | |
| Department / Program | | | | | PhD in Business and Economics | | | | | | | | | | | | | | |
| Forms of Teaching and Learning | | | | |  | | | | | | | | | | | | | | |
| Course Type | | | | | **Compulsory** | | |  | | | | | **Elective** | | | | | **X** | |
| Objectives | | | | | In this course, it is aimed to give detailed theoretical information about linear algebra topics and to examine examples related to their application areas. | | | | | | | | | | | | | | |
| Content | | | | | Vectors, matrices, concept of determinant, systems of linear equations, inner product spaces, linear transformations, eigenvalues and eigenvectors, numerical methods | | | | | | | | | | | | | | |
| Prerequisites | | | | |  | | | | | | | | | | | | | | |
| Coordinator | | | | |  | | | | | | | | | | | | | | |
| Lecturer(s) | | | | |  | | | | | | | | | | | | | | |
| Assistant(s) | | | | |  | | | | | | | | | | | | | | |
| Work Placement | | | | |  | | | | | | | | | | | | | | |
| Recommended or Required Reading | | | | | | | | | | | | | | | | | | | |
| Books / Lecture Notes | | | Larson, R., Falvo, D. C., Elementary Linear Algebra Sixth Edition, Houghton Mifflin Harcourt Publishing Company, 2009  Anton, H. Lineare Algebra: Einführung, Grundlagen, Übungen,, Spektrum, 1998. | | | | | | | | | | | | | | | | |
| Other Sources | | |  | | | | | | | | | | | | | | | | |
| Additional Course Material | | | | | | | | | | | | | | | | | | | |
| Documents | | |  | | | | | | | | | | | | | | | | |
| Assignments | | |  | | | | | | | | | | | | | | | | |
| Exams | | |  | | | | | | | | | | | | | | | | |
| Course Composition | | | | | | | | | | | | | | | | | | | |
| Social Sciences | | |  | | | | | | | | | | | | | 40% | | | |
| Educational Sciences | | |  | | | | | | | | | | | | | % | | | |
| Natural Sciences | | |  | | | | | | | | | | | | | % | | | |
| Health Sciences | | |  | | | | | | | | | | | | | % | | | |
| Expert Knowledge | | |  | | | | | | | | | | | | | 60% | | | |
| Assessment | | | | | | | | | | | | | | | | | | | |
| Activity | | | **Count** | | | | | | | | | | | | | **Percentage (%)** | | | |
| Midterm Exam | | | 1 | | | | | | | | | | | | | 40% | | | |
| Quiz | | |  | | | | | | | | | | | | | % | | | |
| Assignments | | |  | | | | | | | | | | | | | % | | | |
| Attendance | | |  | | | | | | | | | | | | | % | | | |
| Recitations | | |  | | | | | | | | | | | | | % | | | |
| Projects | | |  | | | | | | | | | | | | | % | | | |
| Final Exam | | | 1 | | | | | | | | | | | | | 60% | | | |
| Total | | | | | | | | | | | | | | | | **100** | | | |
| ECTS Points and Work Load | | | | | | | | | | | | | | | | | | | |
| Activity | | | **Count** | | | | | | | | **Duration** | | | | | **Work Load (Hours)** | | | |
| Lectures | | | 14 | | | | | | | | 3 | | | | | 42 | | | |
| Self-Study | | | 14 | | | | | | | | 4 | | | | | 56 | | | |
| Assignments | | |  | | | | | | | |  | | | | |  | | | |
| Presentation / Seminar Preparation | | | 2 | | | | | | | | 30 | | | | | 60 | | | |
| Midterm Exam | | | 1 | | | | | | | | 44 | | | | | 44 | | | |
| Recitations | | | 14 | | | | | | | | 1 | | | | | 14 | | | |
| Laboratory | | |  | | | | | | | |  | | | | |  | | | |
| Projects | | |  | | | | | | | |  | | | | |  | | | |
| Final Exam | | | 1 | | | | | | | | 64 | | | | | 64 | | | |
| Total Work Load | | | | | | | | | | | | | | | | **280** | | | |
| ECTS Points (Total Work Load / 28) | | | | | | | | | | | | | | | | **10** | | | |
| Course Learning Outcomes | | | | | | | | | | | | | | | | | | | |
| 1 | Students have theoretical information on linear algebra topics. | | | | | | | | | | | | | | | | | | |
| 2 | Students can make applications related to these topics. | | | | | | | | | | | | | | | | | | |
| Weekly Content | | | | | | | | | | | | | | | | | | | |
| 1 | Vectors and vector spaces | | | | | | | | | | | | | | | | | | |
| 2 | Subspaces, basis, dimension, coordinates and change of basis | | | | | | | | | | | | | | | | | | |
| 3 | Matrices and operations with matrices | | | | | | | | | | | | | | | | | | |
| 4 | The concept of determinant and properties of the determinant | | | | | | | | | | | | | | | | | | |
| 5 | Solution of linear equation systems | | | | | | | | | | | | | | | | | | |
| 6 | Solution of linear equation systems | | | | | | | | | | | | | | | | | | |
| 7 | Inner product spaces | | | | | | | | | | | | | | | | | | |
| 8 | Inner product spaces | | | | | | | | | | | | | | | | | | |
| 9 | Midterm exam | | | | | | | | | | | | | | | | | | |
| 10 | Linear transformations | | | | | | | | | | | | | | | | | | |
| 11 | Linear transformations | | | | | | | | | | | | | | | | | | |
| 12 | Eigenvalues and eigenvectors | | | | | | | | | | | | | | | | | | |
| 13 | Eigenvalues and eigenvectors | | | | | | | | | | | | | | | | | | |
| 14 | Eigenvalues and eigenvectors | | | | | | | | | | | | | | | | | | |
| 15 | Numerical methods | | | | | | | | | | | | | | | | | | |
| Contribution of Learning Outcomes to Program Objectives (1-5) | | | | | | | | | | | | | | | | | | | |
| CLO | **P1** | | | **P2** | | | **P3** | | |
| 1 | 5 | | | 5 | | | 5 | | |
| 2 | 5 | | | 5 | | | 5 | | |
| Contribution Level | | 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| Compiled by: | | Dr. Mehmet Hakan Özdemir | | | | | | | | | | | | | | | | | |
| Date of Compilation: | | 16.05.2021 | | | | | | | | | | | | | | | | | |