| LINEEAR ALGEBRA I |  |  |   |  |  |  |  |  |  |
|-------------------|--|--|---|--|--|--|--|--|--|
| 1                 | Course Title:  | LINEEA   | AR ALGEBRA I  |  |  |  |  |  |  |
| 2                 | Course Code:   | MAT0503  |   |  |  |  |  |  |  |
| 3                 | Type of Course:  | Optional   |   |  |  |  |  |  |  |
| 4                 | Level of Course:   | First Cycle  |   |  |  |  |  |  |  |
| 5                 | Year of Study:   | 2  |   |  |  |  |  |  |  |
| 6                 | Semester:  | 3  |   |  |  |  |  |  |  |
| 7                 | ECTS Credits Allocated:                                    | 4.00   |   |  |  |  |  |  |  |
| 8                 | Theoretical (hour/week):                                   | 3.00   |   |  |  |  |  |  |  |
| 9                 | Practice (hour/week):                                      | 0.00   |   |  |  |  |  |  |  |
| 10                | Laboratory (hour/week):                                    | 0  |   |  |  |  |  |  |  |
| 11                | Prerequisites:   | -  |   |  |  |  |  |  |  |
| 12                | Language:  | Turkish  |   |  |  |  |  |  |  |
| 13                | Mode of Delivery:  | Face to face   |   |  |  |  |  |  |  |
| 14                | Course Coordinator:  | Prof. Dr. Atilla AKPINAR   |   |  |  |  |  |  |  |
| 15                | Course Lecturers:  | Prof.Dr. Basri ÇELİK<br>Prof.Dr. Esen İYİGÜN   |   |  |  |  |  |  |  |
| 16                | Contact information of the Course<br>Coordinator:          | E-posta: aakpinar@uludag.edu.tr<br>Telefon: +90 224 2941774<br>Adres: Bursa Uludağ Üniversitesi Fen-Edebiyat Fakültesi Matematik<br>Bölümü 16059 Görükle-Bursa-TÜRKİYE   |   |  |  |  |  |  |  |
| 17                | Website:   |  |   |  |  |  |  |  |  |
| 18                | Objective of the Course:                                   | The primary objective of this course is to introduce algebraic<br>structures as group, ring, field and so to understand the concept of<br>vector space, which is constructed over these structures, with basic<br>properties and applications. |   |  |  |  |  |  |  |
| 19                | Contribution of the Course to<br>Professional Development: | the ability of finding solution to problems and analytical thinking.   |   |  |  |  |  |  |  |
| 20                | Learning Outcomes:   |  |   |  |  |  |  |  |  |
|                   |  | 1  | knows the concepts of group, ring, field  |  |  |  |  |  |  |
|                   |  | 2  | gives an understanding of the algebra of finite-dimension vector spaces as a basis for further study of abstract algebra  |  |  |  |  |  |  |
|                   |  | 3  | acquires an understanding of some fundamental ideas of<br>linear algebra, including vectors, vector spaces, linear<br>independence, bases, dimension and linear<br>transformations, especially in the case of Rn and Cn |  |  |  |  |  |  |
|                   |  | 4  | knows sub-vector spaces   |  |  |  |  |  |  |
|                   |  | 5  | learns real and complex inner product.  |  |  |  |  |  |  |
|                   |  | 6  | knows the concepts of linear independence, basis and dimension.   |  |  |  |  |  |  |
|                   |  | 7  | uses the Gram-Schmidt algorithm to orthonormalize a set of vectors.   |  |  |  |  |  |  |
|                   |  | 8  |   |  |  |  |  |  |  |
|                   |  | 9  |   |  |  |  |  |  |  |
|                   |  | 10   |   |  |  |  |  |  |  |
| 21                | Course Content:  |  |   |  |  |  |  |  |  |
|                   |  | Co   | ourse Content:  |  |  |  |  |  |  |
| Week              | Theoretical  |  | Practice  |  |  |  |  |  |  |

| 1                         | Groups   |           |  |                     |  |                               |  |  |  |  |
|---------------------------|--|-----------|--|---------------------|--|-------------------------------|--|--|--|--|
| 2                         | Fields and subfields   |           |  |                     |  |                               |  |  |  |  |
| 3                         | The definition of vector spaces and th<br>examples   | neir      |  |                     |  |                               |  |  |  |  |
| 4                         | Standart vector spaces R^(n) and C^  | (n)       |  |                     |  |                               |  |  |  |  |
| 5                         | Subvector spaces   |           |  |                     |  |                               |  |  |  |  |
| 6                         | The properties of vector spaces R^(n   | )         |  |                     |  |                               |  |  |  |  |
| 7                         | Midterm exam and evaluation of midt exam, repeat of previous subjects  | erm       |  |                     |  |                               |  |  |  |  |
| 8                         | Linear independent, the method of orthogonality  |           |  |                     |  |                               |  |  |  |  |
| 9                         | The properties about basis of vector s<br>dimensions of subspaces  | spaces,   |  |                     |  |                               |  |  |  |  |
| 10                        | Space of direct sums and subspaces<br>product spaces   | of inner  |  |                     |  |                               |  |  |  |  |
| 11                        | Linear transformations in vector spac<br>examples of linear transformation                                     | es and    |  |                     |  |                               |  |  |  |  |
| Activit                   | es   |           |  | Number              | Duration (hour)                                  | Total Work<br>Load (hour)     |  |  |  |  |
| Theore                    | tipatrices   | ,         |  | 14                  | 3.00   | 42.00                         |  |  |  |  |
| Practica                  | als/Labs   |           |  | 0                   | 0.00   | 0.00                          |  |  |  |  |
| Self stu                  | dy and preperation   | (v,vv)    |  | 14                  | 2.00   | 28.00                         |  |  |  |  |
| Homew                     | vorks  |           |  | 0                   | 0.00   | 0.00                          |  |  |  |  |
| Project                   | Materials:   |           | 2  | Uvgulamalı Lineer C | nacısannogiu, Anka<br>0.00<br>bir B.Kol-D.R.Hill | na, 1905<br>000<br>(lercume). |  |  |  |  |
| Field S                   | tudies   |           | _  | 0                   | 0.00 0.00  |                               |  |  |  |  |
| Midtern                   | n exams  |           | 4 Elemantary Linear Algebra, Hartfiel Hobbs, 1987. P |                     |  |                               |  |  |  |  |
| Others                    |  |           |  | 0                   | 0.00   | 0.00                          |  |  |  |  |
| Fi <b>fa</b> E            | Assesment  |           |  | 1                   | 25.00  | 25.00                         |  |  |  |  |
| Total W                   | /ork Load  |           |  |                     |  | 120.00                        |  |  |  |  |
| <b>Trittle M</b>          | ဖုန်းဖြက်ရှိနှင့်ဖျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက်နောက်မျက | 1         | 4  | 0.00                |  | 4.00                          |  |  |  |  |
| ECTS (                    | Credit of the Course   |           |  |                     |  | 4.00                          |  |  |  |  |
| Home v                    | work-project   | 0         | 0.00   |                     |  |                               |  |  |  |  |
| Final E                   | xam  | 1         | 60.00  |                     |  |                               |  |  |  |  |
| Total                     |  | 2         | 100.00   |                     |  |                               |  |  |  |  |
| Contrib<br>Succes         | ution of Term (Year) Learning Activitie<br>s Grade   | es to     | 40.00  |                     |  |                               |  |  |  |  |
| Contrib                   | ution of Final Exam to Success Grade   | )         | 60.00  |                     |  |                               |  |  |  |  |
| Total                     |  |           | 1(   | 100.00              |  |                               |  |  |  |  |
| Measur<br>Course          | rement and Evaluation Techniques Us  | ed in the | The system of relative evaluation is applied.        |                     |  |                               |  |  |  |  |
| 24 ECTS / WORK LOAD TABLE |  |           |  |                     |  |                               |  |  |  |  |

| 25   | CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME<br>QUALIFICATIONS |     |     |     |       |     |          |     |     |          |      |      |             |      |      |      |
|--|--|-----|-----|-----|-------|-----|----------|-----|-----|----------|------|------|-------------|------|------|------|
|  | PQ1  | PQ2 | PQ3 | PQ4 | PQ5   | PQ6 | PQ7      | PQ8 | PQ9 | PQ1<br>0 | PQ11 | PQ12 | PQ1<br>3    | PQ14 | PQ15 | PQ16 |
| ÖK1  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| ÖK2  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| ÖK3  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| ÖK4  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| ÖK5  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| ÖK6  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| ÖK7  | 0  | 1   | 0   | 1   | 0     | 0   | 0        | 0   | 0   | 0        | 0    | 0    | 0           | 0    | 0    | 0    |
| LO: Learning Objectives PQ: Program Qualifications |  |     |     |     |       |     |          |     |     |          |      |      |             |      |      |      |
| Contrib<br>ution<br>Level:                         | ontrib 1 very low<br>ition<br>evel:                              |     |     |     | 2 low |     | 3 Medium |     |     | 4 High   |      |      | 5 Very High |      |      |      |