

## MATH225 Linear Algebra and Differential Equations

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| <b>Semester:</b>            | Fall Semester 2026-2027                                                                                                                         |
| <b>Coordinator:</b>         | LAURENCE BARKER                                                                                                                                 |
| <b>Office:</b>              | Room #SA129 (Faculty of Science)                                                                                                                |
| <b>Phone:</b>               | 2120                                                                                                                                            |
| <b>Email:</b>               | barker bat fen bot bilkent bot edu bot tr .                                                                                                     |
| <b>Course webpage:</b>      | MOODLE system through STARS.                                                                                                                    |
| <b>Exams &amp; Grading:</b> | Midterm Exam (40 %) November 6, 2026 at 5:30 pm.<br>Final Exam (40 %) T.B.A.<br>Quiz (5 %) ( $\Sigma = 6$ )<br>Homework (15 %) ( $\Sigma = 5$ ) |
| <b>Course Schedule:</b>     | Section 06: Mondays 13:30 - 15:20, Thursdays 08:30 - 10:20, A-229.<br>Section 03: Tuesdays 13:30 - 15:20, Thursdays 08:30 - 10:20, B-104.       |
| <b>Office Hours:</b>        | Fridays, 12:30 - 13:20                                                                                                                          |
| <b>Textbook:</b>            | <i>Differential Equations and Linear Algebra, 4th edition</i> ,<br>by C.H. Edwards & D.E. Penney, (Prentice Hall, 2010).                        |
| <b>Web Link:</b>            | <i>MyLab Math</i> , details on MOODLE.                                                                                                          |

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### Homework Policy:

- All homework assignments are completed electronically via **MyLab Math**, a platform offered by Pearson Education as a companion to the textbook.
- All students must register for MyLab Math, either by using the **access code** included with the textbook or by purchasing it separately (for those who do not wish to buy the textbook). Both options are available at the Meteksan Bookstore.
- There will be **5 homework assignments**. No homework scores will be dropped.
- There are **no make-ups** for homework assignments.
- Late homework assignments will **not be accepted**.

### Quiz Policy:

- There will be a total of 6 quizzes. The lowest quiz grade will be dropped.
- No make-up quizzes will be given for missed quizzes.

### Make-up Policy for Exams:

- You must provide a **valid written** excuse to qualify for a make-up exam, which must be approved by your department or institution.
- A **single make-up exam** will be given during the last week of classes. It covers the entire syllabus, and students should expect it to be more challenging than the missed exam.

### Attendance Policy:

- Attendance **will be taken during each hour** of the lectures and entered into STARS.
- At Bilkent University, attendance is **mandatory**.
- You must be in class **before** the lecture begins. Latecomers will not be admitted.

### Classroom Policy:

- Any behavior that distracts or disturbs the other students or the instructor, or disrupts the lecture in any way is unacceptable and will not be tolerated.
- Any student engaging in inappropriate behavior will be asked to leave. You should come to class only if you are able to give your entire attention to the lecture.
- *When communicating, address everyone in the room. Questions and comments enhance classroom learning, and they are very welcome.*

### Grading Policy:

The method used to determine the letter grade for the course will be either the catalog system described below or the grading curve system, and this will be decided at the end of the semester after the final exam.

| <i>A total score<br/>in the interval</i> | <i>earns a letter<br/>grade of</i> | <i>A total score<br/>in the interval</i> | <i>earns a letter<br/>grade of</i> |
|------------------------------------------|------------------------------------|------------------------------------------|------------------------------------|
| [0,30)                                   | F                                  | [60,65)                                  | B–                                 |
| [30,40)                                  | D                                  | [65,70)                                  | B                                  |
| [40,45)                                  | D+                                 | [70,75)                                  | B+                                 |
| [45,50)                                  | C–                                 | [75,80)                                  | A–                                 |
| [50,55)                                  | C                                  | [80,100]                                 | A                                  |
| [55,60)                                  | C+                                 |                                          |                                    |

- The total score is computed out of 100 according to the weights given in the syllabus. There is no rounding up.
- If your midterm exam is less than 20 out of 100 then you will receive an **FZ** grade.
- Students who miss the Final Exam earn an **FX** only if their course total corresponds to an **F**.

## Tentative Schedule

| Week |                 | Subject                                                                                                 | MT & HW |
|------|-----------------|---------------------------------------------------------------------------------------------------------|---------|
| #1   | Sep 16 – Sep 18 | Introduction to Linear Systems, Matrices and Gaussian Elimination: 3.1, 3.2                             |         |
| #2   | Sep 21 – Sep 25 | Reduced-Row Echelon Matrices, Matrix Operations, Inverses of Matrices: 3.3, 3.4, 3.5                    |         |
| #3   | Sep 28 – Oct 2  | Determinants, General Vector Spaces, Vectors and Vector Spaces: 3.6, 4.7, 4.1                           | HW1     |
| #4   | Oct 5 – Oct 9   | Subspaces, Linear Combinations and Independence of Vectors: 4.2, 4.3                                    |         |
| #5   | Oct 12 – Oct 16 | Linear Combinations and Independence of Vectors, Bases and dimensions for Vector Spaces: 4.4            |         |
| #6   | Oct 19 – Oct 23 | Row and Column Spaces, Orthogonal Vectors in $\mathbb{R}^n$ : 4.5, 4.6. The Gram-Schmidt process.       | HW2     |
| #7   | Oct 26 – Oct 30 | Eigenvalues and Eigenvectors: 6.1                                                                       |         |
| #8   | Nov 2 – Nov 6   | Diagonalisation of Matrices and Applications: 6.2, 6.3                                                  | MT      |
| #9   | Nov 9 – Nov 13  | Introduction to Differential Equations, General and Particular Solutions: 1.1-1.3                       |         |
| #10  | Nov 16 – Nov 20 | Separable Equations and Applications, Linear 1st Order Equations: 1.4, 1.5                              | HW3     |
| #11  | Nov 23 – Nov 27 | Substitution Methods and Exact Equations: 1.6                                                           |         |
| #12  | Nov 30 – Dec 4  | First Order Systems, Matrices & Linear Systems, the Eigenvalue Method for Linear Systems: 7.1, 7.2, 7.3 | HW4     |
| #13  | Dec 7 – Dec 11  | Second Order Linear Differential Equations, General Solutions of Linear Equations: 5.1, 5.2             |         |
| #14  | Dec 14 – Dec 18 | Homogeneous Equations with Constant Coefficients, Method of Undetermined coefficients: 5.3, 5.5         |         |
| #15  | Dec 21 – Dec 25 | Variation of Parameters: 5.5                                                                            | HW5     |