Lecturer: Gamze Kuruk
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Office: UC 1089
Office Hours: by appointment

Teaching Assistant: Feyza Teker
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Office Hours: TBA

Important: When you mail any of us always include “MATH 202” in the subject.

Lecture Hours: Tuesdays 11:40-14:30 (FENS L055)
               Wednesdays 13:40-16:30 (FENS L035).

Recitation Hours: Fridays 14:40-16:30 (FASS 1080)

You are responsible for every announcement made in the lectures or on SUCourse. Not attending the lectures or not following SUCourse regularly is not an excuse, in case you miss something.

Course Support Materials


Learning Outcomes: On completion of this course the student should be able to:
1. Apply mathematical modelling in areas such as physics, engineering, biology or economics.
2. Solve first-order separable and linear differential equations.
3. Find the fundamental solution and the general solution of certain second order linear differential equations.
4. Use the Laplace transform method to solve linear ordinary differential equations.
5. Find the particular solution to a nonhomogeneous linear system of ordinary differential equations.

You will find a tentative breakdown of material at the end of the syllabus.

Recitations: The assistant will solve some problems on the white board. The recitation is expected to be in the discussion format.

Grading: Your grade exclusively depends on the following listed items. There will be no other extra-credit opportunities.

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<tbody>
<tr>
<td>Midterm Exam</td>
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<tr>
<td>Final Exam</td>
<td>50%</td>
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<tr>
<td>Lecture Attendance Quiz</td>
<td>6%</td>
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<tr>
<td>Recitation Attendance Quiz</td>
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Exams: There will be one midterm exam and a final exam. The midterm exam will be on the below listed date and time. More detailed information will be available in the due course.

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<tbody>
<tr>
<td>Midterm Exam</td>
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<tr>
<td>Final Exam</td>
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The university will later announce the final exam date. The final may be given on any day between Aug 24th - Aug 27th 2024. Student Resources will determine the dates and times for all final exams, and instructors cannot change it. The last day for grade submissions is Sep 3rd, so do not plan to leave Istanbul before Sep 3rd, 2024. We will not accommodate travel arrangements, or other personal business. Please also see the make-up policy.

During exams, students are NOT allowed to have books, notes, electronic devices (including cell phones, smart watches, calculators, computers etc.), or any other kind of supporting learning material. A student violating this rule will receive 0 points for that exam.

**Lecture Attendance Quiz:** During the lectures there will be pop-up quizzes at random times on some lecture days. In order for the quiz to be valid, students must be present while the pop-up quiz is asked and they need to write their name, surname, ID on the paper they submit and they need to sign the quiz paper. Each quiz will worth 2 points (1 point for participation and 1 point for a decent solution to the quiz question). There will be 7-8 quizzes and the best 6 of your lecture quiz scores will determine your Lecture Attendance Quiz grade. There will be absolutely no makeup for missed quizzes and the late-comers might not be allowed to take the quiz. Students found having a behavior in contrast with Academic Integrity, will receive 0 from the Lecture Attendance Quiz grade component.

**Recitation Attendance Quiz:** During the recitations there will be pop-up quizzes at random times on some recitation days. In order for the quiz to be valid, students must be present while the pop-up quiz is asked and they need to write their name, surname, ID on the paper they submit and they need to sign the quiz paper. Each quiz will worth 2 points (1 point for participation and 1 point for a decent solution to the quiz question). There will be 5-6 quizzes and the best 4 of your recitation quiz scores will determine your Recitation Attendance Quiz grade. There will be absolutely no makeup for missed quizzes and the late-comers might not be allowed to take the quiz. Students found having a behavior in contrast with Academic Integrity, will receive 0 from the Recitation Attendance Quiz grade component.

**Midterm and Final Makeup Policy:** If you miss a midterm or the final and wish to make it up, you must contact the instructor by mail, and explain your excuse before the exam begins. If it is a health problem you need to bring a doctor’s report, which must be given or checked by SU Health Center within 3 days of the date of the report. For other excuses, it will be decided if the student will be allowed to take the makeup exam. Any excuses that are brought to the attention of the instructor after the exam will not be considered. Any exceptions to these rules. Makeup for the midterm or the final will be towards the end of the semester (it could be after the finals period ends). Only students that had contacted the instructor with a valid excuse will be informed about the exact time and place. The makeup exam will contain all topics. There is no makeup for the makeup exam.

**NA Policy:** Students missing both midterm and the final exam without a valid excuse, will receive NA if they also miss the makeup exam.

**Registration Overrides:** Time conflict requests will be accepted. However, any and all negative outcomes that may result are solely the student’s responsibility.

**Academic Integrity:** All university policies on academic integrity apply to our course, and they will be enforced. (more information on [http://www.sabanciuniv.edu/en/academic-integrity-statement](http://www.sabanciuniv.edu/en/academic-integrity-statement)). In particular, no form of cheating is welcome in the exams or quizzes, such as copying whole or part of each other’s answers. Students are not allowed to give or receive outside help. The action against such violations could range from getting a zero on the particular quiz/exam to explaining the case in front of the Disciplinary Committee.

**Class Discipline:** It is our responsibility to provide students with excellent teaching and learning environments. We are therefore asking you to respect both our responsibility to teach and the right of other students to learn. Any action that disturbs your classmates or disrupts the learning environment is unacceptable. Repeated violations of these rules may cause a student to be counted as absent for a lecture or a recitation.

**Global suggestions for the semester:**
- Attend the lecture and recitation regularly and come with a notebook and a pen.
- Feel free to ask your instructor and your assistant questions in and out of class, especially during office hours.
- Remember that you do not have to be a math genius to be successful in this course. Regular study habits are sufficient to get a decent grade.
• Studying out of class for this course should become a routine. Key to success in mathematics is practice.

Below is a tentative breakdown of topics. The order in the tentative schedule might be altered. It is your responsibility to follow the lecture notes posted on SUCourse.

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Dates</th>
<th>Topics (Sections from the textbook)</th>
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| Lecture 1| July 9  | 1.1 Background  
1.2 Solutions and Initial Value Problems  
2.2 Separable Equations                                        |
| Lecture 2| July 10 | 2.3 Linear Equations  
2.4 Exact Equations  
2.5 Special Integrating Factors                                    |
| Lecture 3| July 16 | 2.6 Substitutions and Transformations  
3.1 Mathematical Modeling  
3.2 Compartimental Analysis                                          |
| Lecture 4| July 17 | 4.2 Homogeneous Linear Equations: The General Solution  
4.3 Auxiliary Equations with Complex Roots  
4.4 Nonhomogeneous Equations: The Method of Undetermined Coefficients |
| Lecture 5| July 23 | 4.5 The Superposition Principle and Undetermined Coefficients Revisited  
4.6 Variation of Parameters                                           |
| Lecture 6| July 24 | 4.7 Variable-Coefficient Equations  
6.1 Basic Theory of Linear Differential Equations  
6.2 Homogeneous Linear Equations with Constant Coefficients           |
| Lecture 7| July 30 | 6.3 Undetermined Coefficients and the Annihilator Method  
6.4 Method of Variation of Parameters  
7.2 Definition of the Laplace Transform                               |
| Lecture 8| July 31 | 7.3 Properties of the Laplace Transform  
7.4 Inverse Laplace Transform  
7.5 Solving Initial Value                                              |
| Lecture 9| Aug 6   | 7.6 Transforms of Discontinuous and Periodic Functions  
7.7 Convolution  
7.8 Impulses and the Dirac Delta Function                             |
| Lecture 10| Aug 7   | 7.9 Solving Linear Systems with Laplace Transforms  
8.1 Introduction: The Taylor Polynomial Approximation  
8.2 Power Series and Analytic Functions                               |
| Lecture 11| Aug 13  | 8.3 Power Series Solutions to Linear Differential Equations  
8.4 Equations with Analytic Coefficients  
8.5 Cauchy-Euler (Equidimensional) Equations                           |
| Lecture 12| Aug 14  | 9.1 Introduction  
9.2 Review 1: Linear Algebraic Equations                               |
| Lecture 13| Aug 20  | 9.3 Review 2: Matrices and Vectors  
9.4 Linear Systems in Normal Form                                      |
| Lecture 14| Aug 21  | 9.5 Homogeneous Linear Systems with Constant Coefficients                                                   |