Calculus II (MATH 102)
Sabancı University, Spring 2023-2024

This syllabus may be subject to update and change.

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Coordinators: Çiğdem Çelik & Gamze Kuruk

Important: When you mail any of us include "MATH 102" in the subject.

Lecture Hours: Section A: Mondays 12:40-14:30 and Tuesdays 11:40-12:30 (FASS G062).
Section B: Mondays 14:40-16:30 and Tuesdays 11:40-12:30 (SBS 1099).
Section C: Mondays 11:40-12:30 and Tuesdays 12:40-14:30 (FENS G077).

Recitation Hours: Fridays 08:40-10:30, 10:40-12:30, 12:40-14:30 and 14:40-16:30.

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.

Aim of the Course: We hope to gain an understanding of:

- Sequences and series, approximation of functions by series,
- Functions of several variables,
- Differentiation of functions of several variables,
- Optimizing functions of several variables,
- Integrating functions of several variables,
- Various coordinate systems if time allows.

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

Learning Outcomes: On completion of this course the student should be able to:

1. Define the notion of convergence of series and use various tests to determine series convergence
2. Find Taylor representations of functions and approximate functions via Taylor polynomials
3. Understand and use the concept of a function of several variables, draw graphs in 3 dimensional spaces
4. Use the properties of vectors and operations with vectors
5. Compute partial derivatives, directional derivatives and write equations of tangent planes to surfaces
6. Apply partial derivatives to find and test local extrema
7. Evaluate double integrals in Cartesian and polar coordinates and triple integrals in Cartesian coordinates

Textbook: Calculus Early Transcendentals 2nd Edition (Global Edition), Briggs, Cochran & Gillett.

Recitations: Each recitation will consist of the following activities:
Problem solving: The assistants will solve some problems on the white board.
Group-study: Students will discuss and solve problems from a given worksheet in groups.
Quiz: On some weeks, there will be a quiz at the end of the recitation.

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

Midterm 1	22%
Midterm 2	22%
Final Exam	30%
Lecture Attendance	5%
Recitation Attendance	5%
Recitation Quizzes	16%
Online Homework (requires Pearson MyLab account)	5% (bonus)

Exams: There will be two midterm exams and a final exam. The midterm exams will be on the below listed date and time. More detailed information will be available in the due course.

Midterm I	23.03.2024, Saturday, 09:30
Midterm II	04.05.2024, Saturday, 09:30
Final	TBA

The university will later announce the final exam date. The final may be given on any day between May 30th - June 9th 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 June 13th, so do not plan to leave İstanbul before June 13th, 2024. We will not accommodate travel arrangements, or other personal business.

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: Attendance during the lectures will be checked via pop-up quizzes at random times on some weeks. In order to get the attendance points, you must be in the room while the pop-up quiz is asked and you must answer the quiz question. The best 5 of your lecture quiz scores will determine the Lecture Attendance grade. There will be absolutely no makeup for missed pop-up quizzes. You are required to attend your registered lecture section, otherwise your attendance record will be lost. Students found having a behavior in contrast with Academic Integrity, will receive 0 from the Lecture Attendance grade component.

Recitation Attendance: Attendance in recitations will be taken by signature, in both hours. **To be counted as present, you need to actively attend both full hours and hand in a valid quiz paper, if there is a quiz**. Latecomers will not be allowed to sign the attendance sheet for that hour. There will be absolutely no makeup for missed recitation attendances. You are required to attend your registered recitation section, otherwise your attendance record will be lost. Each attended recitation is worth 1 point. The best 8 will determine the recitation participation grade. Students found having a behavior in contrast with Academic Integrity, will receive 0 from the Recitation Attendance grade component.

You are responsible for keeping track of your attendance records on SUCourse. If any is entered incorrectly, you must notify your lecturer or your TA, within 2 weeks from when they are published, to change it. In general, if you have serious issues preventing you from regularly following the course for an extended period of time, you are required to contact the course coordinators without delay.

Recitation Quizzes: There will be a quiz at the end of the recitation on some weeks. In order to be able to take the quiz, you need to be present during the second hour of the recitation. Latecomers will not be allowed to take the quiz. There will be absolutely no makeup for missed quizzes. The best 4 of your 6 quiz scores will determine the Recitation Quiz grade. More details will be announced on SUCourse.

During quizzes, 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 quiz.

Important: Every quiz paper (in recitations or pop-up quizzes in lectures) needs to be hand-written and to have name, surname, student ID, and signature on the top left corner of the document, on each page submitted. Any page missing any of these information will be completely ignored.

Online Homework: Detailed instructions on how to register to Pearson MyLab will be given on SUCourse+ during the second week of the semester. The online homework will be assigned on the weekend and will be due on Thursday at 23:45. To do the homework, after logging into their personal MyLab account, each student will receive a random set of questions. There will be no makeup for any online homeworks if you miss the deadline.

Midterms and Final Makeup Policy: If you miss a midterm or the final and wish to make it up, you must contact Gamze Kuruk 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. Makeup for the midterms or the final will be at the end of the semester (after the finals period ends). Only students that had contacted the coordinator 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 2 exams without a valid excuse, will receive NA if they also miss the makeup.

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`).

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:

- *Always* come to lectures and recitations with a notebook and a pen.
- Feel free to ask your instructor and your assistants 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 (although it wouldn't hurt!). Regular study habits are sufficient to get a decent grade.
- Attend the classes and recitation hours regularly.
- Studying out of class for this course should become a routine. Key to success in mathematics is practice.
- GeoGebra and Desmos are useful softwares/websites to visualize many of the concepts we discuss.

In the *Resources* section of SUCourse, a list of problems will be provided from each section covered in the book. These problems are for self-study and preparation for the recitation quiz. You are not supposed to return their solutions to us.

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.

Weeks	**Dates**	**Topics (Sections from the book)**
Week 1	Feb. 19, 20	8.1 - 8.2 Sequences 8.3 Infinite series
Week 2	Feb. 26, 27	8.3 Infinite series (cont'd) 8.4 Divergence Test, Integral Test, p-test 8.5 Ratio Test, Root Test
Week 3	Mar. 4, 5	8.5 Comparison Test, Limit Comparison Test 8.6 Alternating Series Test, Absolute convergence 9.1 Taylor polynomials
Week 4	Mar. 11, 12	9.2 Power series and their properties 9.3 Taylor series
Week 5	Mar. 18, 19	9.3 Taylor series (cont'd) 9.4 Working with Taylor series 11.1 Vectors in 2D
Week 6	Mar. 25, 26	11.2 Vectors in 3D 11.3 Dot product 11.4 Cross product
Week 7	Apr. 1, 2	12.1 Planes, Cylinders, Quadratic surfaces 12.2 Graphs and level curves
Spring Break (Apr. 8 - 12)		
Week 8	Apr. 15, 16	12.4 Partial derivatives 12.5 The chain rule
Week 9	Apr. 22	12.6 Directional derivatives and the gradient in 2D
Week 10	Apr. 29, 30	12.6 Directional derivatives and the gradient in 3D 12.7 Tangent planes and linear approximation 12.8 Maximum/minimum problems (Second Derivative Test)
Week 11	May 6, 7	12.8 Maximum/minimum problems (absolute maximum/minimum) 12.9 Lagrange Multipliers 13.1 Double integrals over rectangular regions
Week 12	May 13, 14	13.2 Double integrals over general regions
Week 13	May 20, 21	13.3 Double integrals in polar coordinates
Week 14	May 27, 28	13.4 Triple integrals