

MATH 317: Elementary Number Theory, Fall 2021

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Office Hours: by appointment on zoom

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

Textbook:

A Friendly Introduction to Number Theory, by Joseph H. Silverman, Fourth Edition - ISBN: 978-0-321-81619-1 2012 Pearson Education, Inc.

Prerequisites:

MATH 102 and MATH 201.

Course Description:

MATH 317 is an introductory course to number theory. Much emphasis is put on problem solving and writing rigorous mathematical proofs.

Throughout this course, you are expected to be able to:

- Read, understand and construct rigorous mathematical proofs, e.g., mathematical induction, direct and indirect proofs
- Present mathematical work, both in oral and written format, to various audiences (mathematicians, and non-mathematicians).

The course covers the following topics:

- 1) Divisibility of integer numbers and the Euclidean algorithm
- 2) The Fundamental Theorem of Arithmetic
- 3) Multiplicative arithmetic functions and interesting numbers: perfect numbers, Fermat numbers and Mersenne numbers
- 4) Congruences and polynomial congruences
- 5) Chinese Remainder Theorem
- 6) Primitive roots
- 7) Quadratic residues, Jacobi symbols and Quadratic reciprocity
- 8) Pseudoprimes

9) Pythagorean triangles

Guideline for the syllabus:

- Create a Zoom account using your sabanciuniv.edu address.
- Follow the announcements on SUCourse+.
- A list of suggested problems will be posted on SUCourse+. Solving these problems will help you get a good grasp of the material. Please do attempt all problems.
- Take advantage of the Office Hours to ask further questions.

Grading:

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

- Attendance and Participation: 5%
- 6-8 Quizzes: 18%
- Two Midterms: 25% each
- Final Exam: 30%

There will be four lists of suggested problems. Please solve them all as they will help you get prepared for exams.

Your grade depends ONLY on the items listed below. There will be no extra-credit opportunities. Locations of Midterms will be announced in fashionable time.

All exams are cumulative. What you fail to learn in the beginning may hurt you at the end.

Important:

If your attending the class virtually, then

- Attendance is checked using the log files of Zoom. You are required to register a Zoom account using the sabanciuniv.edu mail address provided by the university. Log data related to other mail addresses will be ignored.
- It is preferable that you keep your webcam on for better interaction.
- Every submitted quiz needs to be hand-written, to be converted to pdf, and to include name, surname, student ID, and signature in the top left corner of each page (note: if you write on the two sides of a piece of paper, write the information on both sides). Any page missing any of the items above will be ignored.
- Quiz submissions by mail are never considered, SUCourse+ is the only means accepted.

NA Policy:

Students missing two exams (out of three), will receive NA. If you will have serious issues preventing you from regularly following the course, you are required to contact your instructor.

Midterms:

The midterms and final exam will take place on campus. More details are announced on SUCourse+.

Midterm 1, to be held on Saturday 06.11.2021, 10:30 am – 12:00 pm

Midterm 2, to be held on Saturday 11.12.2021, 10:30 am – 12:00 pm

There is NO extra credit. Also, there will be NO make-up exams, unless the circumstances are extraordinary.

Is there anything I need to know for exams?

- 1) You must SHOW ALL WORK on exams. Unsupported answers are considered miracles and, while inspirational, will receive little or no credit.
- 2) Graded exams will be returned to you as soon as possible.

Quizzes: There will be short pop-up quizzes on SUCourse+ taking place during the last 10 minutes of the lecture. During the entire duration of each quiz, students attending via zoom are proctored and recorded. There will be no make-up for missed quizzes. At the end of the semester, the worst two quizzes will be dropped.

Midterms and Final Make-up Policy: If you miss a Midterm/Final and wish to make it up, you must contact your instructor by mail, and explain your excuse as soon as possible. Only students that had contacted the instructor with a valid documented excuse will be contacted to arrange the terms of the exam.

Classroom Discipline:

It is our responsibility to provide students with excellent learning environments. We are therefore asking you to please respect both our responsibility to teach and the right of other students to learn. Any action that disturbs your classmates or interrupts the lecture is unacceptable. The following rules must be followed in all classes:

1. Classes will start on time. By coming to a class late, you will lose important material and announcements.
2. If you are unable to attend a class, you are responsible to find out what you have missed.
3. You are responsible for every announcement made in class or on SUCourse+.

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 general, to ensure Academic Integrity, any student might be asked to validate any activity contributing to their grade in an interview via Zoom (recorded, with audio and video). A student failing to explain the submitted work, or refusing/missing the interview, will receive zero from that work.

In particular, no form of cheating is welcome in the exams or quizzes, such as copying whole or part of each other's answers, using cheat-sheets etc. 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.