MATH102 Number Theory - SECTION 02

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Welcome to Math 102- 02

Course modality: Synchronous on Zoom

Course number: 36803

Topics covered, as time allows: Divisibility and primes, The Euclidean Algorithm, The Fundamental Theorem of Arithmetic, applications, multiplicative and completely multiplicative functions, linear Diophantine equations, fundamental properties of congruences, complete residue systems, linear congruence equations, reduced residue systems, The Euler Totient function, primitive roots, Fermat-Pell equations, and Pythagorean Triples.

Prerequisites: Math 31, second semester calculus.

Instructor: Dr. E. Ebrahimzadéh

ese@csus.edu **(mailto:ese@csus.edu)** Tel. **916-541-0706** (tel:916-541-0706)

Zoom Class time: Tue. and Th. 9:00 - 10:15am

Join URL: **https://csus.zoom.us/j/86068556924?**

[pwd=aU1SUkpwS3MxeFM5OXFEWk4wL2pyZz09](https://csus.zoom.us/j/86068556924?pwd=aU1SUkpwS3MxeFM5OXFEWk4wL2pyZz09) ↗ [(https://csus.zoom.us/j/86068556924?pwd=aU1SUkpwS3MxeFM5OXFEWk4wL2pyZz09)](https://csus.zoom.us/j/86068556924?pwd=aU1SUkpwS3MxeFM5OXFEWk4wL2pyZz09)

Links to an external site.

Smart phones are not the appropriate device for attending lectures, as the screen is too small for most of your needs. The university provides laptops for students who do not own a computer.

Zoom Office hours: Tue.   10:30 - 11:20am in personal meeting room.

Wed. 12:00 – 12:50pm in personal meeting room.

Personal meeting room: **https://csus.zoom.us/my/chomskyjan?pwd=TU5CSU9VZ3pSSDRCVjV1S2t0VmhMUT09** [(https://csus.zoom.us/my/chomskyjan?pwd=TU5CSU9VZ3pSSDRCVjV1S2t0VmhMUT09)](https://csus.zoom.us/my/chomskyjan?pwd=TU5CSU9VZ3pSSDRCVjV1S2t0VmhMUT09)

[(https://csus.zoom.us/my/chomskyjan?pwd=TU5CSU9VZ3pSSDRCVjV1S2t0VmhMUT09)](https://csus.zoom.us/my/chomskyjan?pwd=TU5CSU9VZ3pSSDRCVjV1S2t0VmhMUT09) Links to an external site.

During office hours, for safety, we will have a waiting room.

Assignments: I proceed at the pace of the class every day, therefore I do not have a predetermined set of assignments with dates. Homework is given at the end of most lectures and is generally due before the following class. I go over requested homework problems in class.
Please scan homework as a pdf and email to ese@csus.edu

Attendance: In Mathematics today's lecture is built on the foundation of yesterday's lecture, therefore, there is no room for absences. **Attending, on camera, all 29 live Zoom lectures, which amount to a total of 2,175 minutes, and completing all assignments and quizzes on time are all prerequisites for passing this class**. Emergencies must be documented as soon as possible and will be considered at the end of the semester. **Joining the Zoom session on time, with your camera on, is necessary for you to be considered present, as is staying in class for the duration of class and answering whenever you are called on.**

Course score calculated as a percentage:

Two mid-terms, worth 20% each,

Quizzes worth 20% collectively.

A **cumulative** final worth 40% with a 2 hour written component and a 20 to 30 minute individual oral component.

Passing grades are A through C- :

A requires no absences, no late assignments, and course score in [95,100)

A- requires no absences, no late assignments, and course score in [90,95)

B+ requires no absences, no late assignments, and course score in [85,90)

B requires no absences, no late assignments, and course score in [80,85)

B- requires no absences, no late assignments, and course score in [75,80)

C+ requires no absences, no late assignments, and course score in [70,75)

C requires no absences, no late assignments, and course score in [65,70)

C- requires no absences, no late assignments, and course score in [60,65)

Students who do not fall in one of the above categories will not pass the class.

Midterms, quizzes, and the final exam are closed book and they must be taken on camera during the synchronous live session, if not, they will not be accepted and the student will fail the class.

Should you miss a midterm for reasons beyond your control we will use your final to replace the missing score.

Written final examination: 10:15am - 12:15pm, Tuesday May 17th, 2022
The link for the written final exam is the same as our regular class.

The oral component will be given separately to each student at a time of their choosing during finals' week.

Your email: We need to communicate with you in an expedient and prompt manner. Please go to Canvas and click on account, then on settings, and make sure the email you have entered is your preferred email. At some point you will be asked how frequently you wish to receive Canvas notifications; select I wish to be notified right away.

Recordings: Lectures will be recorded on the cloud. To retrieve a recording, click on Zoom in the left navigation menu, then click on cloud recordings, and finally enter the date of the session you wish to view. **The recordings are not to be used in lieu of attending the live sessions.** Their purpose is to give you a chance to hear the lecture again and read the chat comments again. If, due to an emergency, you miss a lecture, please watch the recording as soon as possible.

Technology: We will use Zoom for all our lectures, office hours and examinations, and we will use

Canvas as needed. However, the technology is only a delivery tool, the essence of the course is mathematics, pure and simple, and I intend to present the course in such a way that you will not need to spend an inordinate amount of time maneuvering the platforms.

Drop Policy: Please see the department policy here: **https://www.csus.edu/college/natural-sciences-mathematics/mathematics-statistics/_internal/docs/drop-policy.pdf** (https://www.csus.edu/college/natural-sciences-mathematics/mathematics-statistics/_internal/docs/drop-policy.pdf)

Interaction: I have taught Mathematics for close to 50 years and my teaching style has always been very interactive. I used to learn the students' names by the end of week 2 and could address them by name, ask them if the material was clear, so on and so forth. Let's do our best to keep the class as interactive as possible. Please make sure your full name appears on Zoom. Feel free to raise your hand when you have a question. The feature is found by clicking on the participants icon at the bottom of your screen. Please lower it when your question is answered. If time does not allow me to answer your question during class please enter it in the chats and I will address it later.

With utmost discipline on your part and clear lectures on my part this should be an enjoyable course. Do your best to stay healthy, and enjoy the semester!

Learning Objectives: *In this course, students will (1) increase their capacity for critical thinking and fact-based reasoning, (2) develop the necessary competency with the concepts and mechanics of basic number theory for further work in mathematics and other fields, (3) improve their written and oral communication of mathematics, and (4) develop the skills and mindset for solving problems. Some specific outcomes:*

— understanding basic properties of integers including divisibility and unique factorization;
— understanding congruences, congruence arithmetic, linear congruence equations;
— knowledge of some of basic theorems in number theory;
— understanding number theoretic functions such as the number of divisors of an integer;
— ability to find primitive roots and solve Diophantine equations.

The Classroom Community: *Students in this class bring together a rich set of backgrounds, experiences, and perspectives. This class puts great value on the Hornet Honor Code, which can be found here:*
https://www.csus.edu/diversity-inclusion/_internal/_documents/honor-code1.pdf (https://www.csus.edu/diversity-inclusion/_internal/_documents/honor-code1.pdf)

Zoom netiquette: Please:
• Arrive 5 minutes early to Zoom sessions to log in and test your audio and video, so sessions can begin on time.

• Keep your microphone muted unless speaking to reduce background noise.

• Take a moment to make sure your name is correctly displayed.

• Enable your Zoom chat panel and "reactions" such as raise hand, yes/no, thumbs up/down..

• If you need to step away from class for a moment, please use the chat to let us know.

Student resources:

- **Disability Resources** (https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities/) : Information and Resources for people with disabilities at CSUS.

- **General COVID-19 Related Questions** (https://www.csus.edu/student-affairs/emergency-student-information/health-counseling-updates.html) :   Information regarding how to self-diagnose and direction not to come to campus if sick.

- **Student Health and Counseling Services** (https://www.csus.edu/student-life/health-counseling/)

- **Crisis Assistance and Resource Education Support (CARES)** (https://www.csus.edu/student-affairs/crisis-assistance-resource-education-support/)

- **Sac State Mobile App** (https://www.csus.edu/information-resources-technology/communication-collaboration/sacstate-mobile.html) :   Information regarding using the mobile app for coming on campus.