MATH 437, Number Theory

COURSE SYLLABUS: SPRING- 2024

INSTRUCTOR INFORMATION

Instructor:	Padmapani (Pani) Seneviratne
Office Location:	BIN 316
Office Hours:	TR: 11:30 – 12:30 pm, TR: 2:00 – 3:30 pm
Office Phone:	903-886-5952
Office Fax:	903-886-5945
University email:	padmapani.seneviratne@tamuc.edu
Preferred Communication:	email
Response time:	within 24 hours during weekdays
Class Location:	BIN 301
Class Time:	TR 12:30 – 1:45 pm

COURSE INFORMATION

Textbook: Number Theory: In Context and Interactive, Karl-Dieter Crisman, freely available at http://math.gordon.edu/ntic/download.html

Software : Magma computer algebra system will be provided.

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Calculator: optional.

Course Description

Mathematical induction, divisibility, prime numbers, congruences, factorization, arithmetic functions, quadratic reciprocity, primitive roots, diophantine equations. Prerequisites: MATH 332 or 2305 with grade of "C" or higher.

The *syllabus/schedule are subject to change.*

Student Learning Outcomes Upon successful completion of this course a students will:

- Learn the concept of division including greatest common divisor, least common multiple and the Euclidean algorithm.
- Understand Diophantine equations and their applications.
- Be able to solve linear congruences and apply the Chinese Remainder Theorem to solve a system of linear congruences.
- Understand the Fundamental Theorem of Arithmetic.
- Find the group of units, Euler's functions and use Fermat's Little Theorem.
- Learn applications of number theory and use a computer algebra system.

Core Objectives: This course addresses the core objectives of critical thinking skills, communication skills, and empirical and quantitative skills

1). Students will be able to analyze, evaluate, or solve problems when given a set of circumstances or data.
This common core objective will be assessed in the tests, quizzes and final exam.

2) In written, oral, and/or visual communication, A&M-Commerce students will communicate in a manner appropriate to audience and occasion, with an evident message and organizational structure.
This common core objective will be assessed using class activities with class discussion, activities involving writing proofs and programming projects

3) **Students will be able understand and utilize mathematical functions and empirical principles and processes.**

This common core objective will be assessed using class activities, homework problems, tests and a final exam.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Access MyLeo online. Learn and use of a computer algebra system.

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Instructional Methods

Traditional lecture and use of a computer algebra system to illustrate computational problems.

Student Responsibilities or Tips for Success in the Course

Attendance: It is expected that you attend classes daily and it is your responsibility to sign the daily class roll sheet. It is expected that you follow the guidelines set forth by the Class Attendance Policy in the current undergraduate catalogue.

Home Work/Quizzes: There will be announced weekly quizzes and/or homework.

Extra credit: You will receive extra credit for attending the Mathematics colloquium (which will be announced during the semester) and attending math club and other math related activities.

Project: Students are expected to read about a topic related to number theory that interest them, including computational simulations, write a report (maximum 2-3 pages) and conduct a final presentation (10-15 minutes)

GRADING

Final grades in this course will be based on the following scale:

Midterm Exams:	50%
Homework/quizzes:	15%
Project	10%
Final Exam:	25%
Total:	100%

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

Exams: There will be two midterm exams and a comprehensive final exam for this course.

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Exam 1: Thursday 26th February 2024.

Exam 2: Thursday 5th April 2024.

Final Exam: Thursday, May 09th 2024, 10:30-12:30 pm

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:
https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

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Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

You are expected to attend all classes.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

Appropriate classroom behavior is required to attend this class.

All cell phones must be put on silent during class.

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

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Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

The *syllabus/schedule are subject to change.*

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

A&M-Commerce Supports Students' Mental Health

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit **www.tamuc.edu/counsel**

AI use policy

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors 'guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

The *syllabus/schedule are subject to change.*

13.99.99.R0.10 Graduate Student Academic Dishonesty

COURSE OUTLINE / CALENDAR

Weekly Schedule

Week	Topic
1	Introduction to Magma/chapter 1
2	Chapter 2
3	Chapter 3
4	Chapter 4
5	Chapter 5
6	Chapter 6
7	Chapter 7
8	Chapter 8
9	Chapter 9
10	Chapter 10
11	Chapter 11
12	Chapter 12
13	Chapter 13
14	Chapter 14
15	Chapter 15

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