



MTH 537-Theory of Numbers

Course Syllabus: Spring 2018

INSTRUCTOR INFORMATION

Instructor: Padmapani Seneviratne, Ph.D.
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Office Hours: MWF: 11:00 – 12:00 pm, T: 11:00 – 13:00 or by appointment.

Class Schedule: Meets 2/1/2018 – 5/11/2018

Location: online

COURSE INFORMATION

Location: eCollege (Pearson Learning Studio)

Textbooks:

- Class Notes.

Recommended Reading:

- A classical introduction to modern number theory, Kenneth Ireland & Michael Rosen, Springer-Verlag, ISBN 0-387-97329.
- A computational introduction to number theory and algebra, Victor Shoup, <http://www.shoup.net/ntb/ntb-v2.pdf>
- Elementary number theory and its applications, Kenneth H. Rosen, Addison-Wesley. ISBN 978-0-321-50031-1.

Technology:

- Software: Magma computational algebra system will be used for computations. A free student version will be provided.

Course Description (Catalogue):

Factorization and divisibility, Diophantine equations, congruences, quadratic reciprocity, arithmetic functions, asymptotic density, Riemann's zeta function, prime number theory, Fermat's Last Theorem.

Prerequisites: C or higher in Math 331 or Math 437.

Student Learning Outcomes:

Upon successful completion of this course a students will:

- Understand unique factorization in a principal ideal domain.
- Learn applications of unique factorizations.
- Solve problems related to congruence's and the Chinese remainder theorem.
- Understand the structure of $U\left(\frac{\mathbb{Z}}{n\mathbb{Z}}\right)$, primitive roots and n th power residues.
- Prove the law of quadratic reciprocity.
- Do basic arithmetic in finite fields.

Instructional:

- Class notes and online lectures will be uploaded to eCollege website.

Final Exam Date: Wednesday May 9th 2016 from 3:00 – 5:00 pm, BIN 325.

Tentative course outline: Chapters

1. Introduction to integers, groups and rings.
2. Unique factorization.
3. Congruences.
4. The structure of $U\left(\frac{\mathbb{Z}}{n\mathbb{Z}}\right)$.
5. Quadratic reciprocity.
6. Finite fields.
7. Diophantine equations.
8. Elliptic curves.

COURSE REQUIREMENTS

Attendance:

Online attendance is required. Your log in, homework and participation in our course in eCollege determine online attendance in this course.

The final exam is proctored and you need to attend in person for the final exam. If you cannot take a test on the Commerce campus, you need to let your instructor know the location where you want to take the test at least two weeks in advance. A location usually is a testing center at a college or university near you. Some college and universities may charge you a fee for using the testing center. Once an agreement with the testing center is made, you will be notified. If you have questions, discuss it with your instructor immediately.

Home Work/projects:

Please submit the home work in pdf format. Write clearly and keep space between lines. Save the file as firstname_lastname_HW#.pdf

There will be six homework assignments for this class. Each homework assignment will contain a computational project. Points will be assigned separately. Submit homework to the dropbox at eCollege. You may work together and discuss homework in the student lounge of eCollege, but the assignment that you submit must be your own work. **Plagiarism is prohibited.**

COURSE GRADES

Grading policy: The course grade consists of

Home work:	200 points
Projects :	200 points
Final Exam:	200 points

Total:	500 points

Grading Scale:

A: 90 – 100%, B: 80 – 89%, C: 70 – 79%, D:60 – 69%, F: 0 – 59%

Pearson Learning Studio(eCollege) Requirements

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements for the Epic Web Client are:
 - Any current Flash-compliant browser such as firefox, chrome, internet explorer.
 - 512MB of RAM 1GB preferred.
 - Broadband connection.

- Video display capable of high-color 16-bit display 1024 x 768 or higher resolution.
- A sound card and speakers or headphones.
- Current anti-virus software must be installed and kept up to date
- Some classes may have specific class requirements for additional software. These requirements will be listed on the course offerings page. Most home computers purchased within the last 3-4 years meet or surpass these requirements.
- You will need some additional free software for enhanced web browsing. Ensure that you download the free versions of the following software: Adobe Reader, Adobe Flash Player.
- At a minimum, you must have Microsoft Office 2003, XP, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

Technical Support for eCollege:

The following eCollege support options are available 24 hours a day / 7 days a week:

Help: Click on the 'Help' button on the toolbar for information regarding working with eCollege (i.e. How to submit to Dropbox, How to post to discussions etc...)

Chat Support: Click on 'Live Support' on the tool bar within your course to chat with an eCollege Representative.

Phone: 1-866-656-5511 (Toll Free) to speak with eCollege Technical Support Representative.

Email: helpdesk@online.tamuc.org to initiate a support request with eCollege Technical Support Representative.

For Specific Course Content Questions: Contact Your Instructor. Please contact your instructor via email or through the "Virtual Office."

Your myLeo email address is required to send and receive all student correspondence. Please email helpdesk@tamuc.edu or call us at 903-468-6000 with any questions about setting up your myLeo email account. You may also access information at <https://leo.tamuc.edu>.

COURSE AND UNIVERSITY PROCEDURES/POLICIES
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Withdrawal Policy:

Concerning the deadlines and consequences of withdrawals please check on: <https://ems.tamuc.edu/MasterCalendar/MasterCalendar.aspx>

Academic Integrity:

Texas A&M University –Commerce has explicit rules and regulations governing academic dishonesty and academic misconduct. These policies are stated in details in the student’s Guide Handbook. Each students is expected to read this document and abide by the contained polices. These university polices will be followed in class. The minimum penalty an act of academic dishonesty will be a grade of 0 on the examination or homework assignments.

University Specific Procedures

Students with Disabilities

Students with Disabilities information: 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:

Student Disability Resources & Services
Texas A&M University-Commerce
Gee Library, Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

Nondiscrimination Statement

A&M-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.

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Code of Student Conduct from Student Guide Handbook*).

Campus Concealed Carry Statement

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.