MAT315H1Y: Introduction to Number Theory
Summer 2022
University of Toronto

I. Instructor and Teaching Assistants

Course Instructor

Name: Mehmet Eren Durlanık
Email: mehmet.durlanik@mail.utoronto.ca
Lectures: Monday 11-13 and Wednesday 11-12
Office Hours: Wednesday 13-14

Teaching Assistants

Name: Matthew Sunohara
Email: matthew.sunohara@mail.utoronto.ca
Tutorial Sections: TUT0101 (Monday 13-14) and TUT0201 (Monday 14-15)

Name: Lemonte Alie-Lamarche
Email: lemonte@math.utoronto.ca
Tutorial Sections: TUT0301 (Wednesday 10-11)

The Zoom links to the lectures, office hours, and tutorials will be posted on Quercus.

II. Course Overview

Course Description

Elementary topics in number theory: arithmetic functions; polynomials over the residue classes modulo m, characters on the residue classes modulo m; quadratic reciprocity law, representation of numbers as sums of squares.

Prerequisite

(MAT223H1 / MATA23H3 / MAT223H5 / MAT240H1 / MAT240H5, MAT235Y1 / MAT235Y5 / (MAT232H5, MAT236H5) / (MATB41H3, MATB42H3) / MAT237Y1 / (MATB41H3, MATB42H3, MATB43H3) / MAT237Y5, MAT246H1 / CSC236H1 / CSC240H1) / MAT157Y1 / MAT157Y5 / MAT247H1 / MAT247H5

Course Objectives

This course will provide a basic knowledge of elementary number theory, a subject that is important in many areas of mathematics, computer science, cryptography and security, and elsewhere. We will cover material from Chapters 1—7 of the text by Jones and Jones. Additional topics may be covered as time permits.

Textbooks/Course Readings

Main Textbook: *Elementary Number Theory* by Gareth A. Jones and J. Mary Jones
Other Reference Books: *An Introduction to the Theory of Numbers* by Niven, Zuckerman, and Montogomery; *A Friendly Introduction to Number Theory* by Silverman

Additional course material may be covered in lecture and/or in handouts to be provided.

Lectures

Each week there will be three hours of lectures (Monday 11-13 and Wednesday 11-12) and they will be delivered via Zoom (links are posted on the Quercus page). The lectures will be recorded and posted on Quercus.

Tutorials

Each student must enrol in a tutorial section. Tutorials will start in the second week of the classes. More information regarding the tutorials will be posted on Quercus.

Discussion Forum

For questions about the material or the course, we will use Ed Discussion. You will get faster answers from the instructor, TAs, and other students compared to email.

Technical Requirements

In order to participate in this course, students will be required to have:

- Reliable internet access. It is recommended that students have a high speed broadband connection (LAN, Cable, or DSL) with a minimum download speed of 5 Mbps.
- A computer satisfying the minimum technical requirements: https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/

Other recommended items include headphones, microphone, webcam, and a tablet or printer.

If you are facing financial hardship, you are encouraged to contact your college or divisional registrar: https://future.utoronto.ca/current-students/registrars/ to apply for an emergency bursary.

III. Evaluation/ Grading Scheme

Mark Breakdown

Weekly Quizzes	10%
Problem Sets	40%
Term Test	15%
Final Assessment	35%

Weekly Quizzes

There will be weekly quizzes on Quercus (about 8-10 of them). You will be given a period of minimum 24 hours to attempt a quiz, but you will only have 2-3 hours once you begin. Though these should be short and not require more than 1 hour.

The quizzes will be posted on either Wednesdays or Thursdays. You should expect to have quizzes in weeks 2-5 and weeks 7-11, but this schedule is tentative and may be subject to change.

Problem Sets

There will be 6 problem sets (posted minimum seven days before their deadlines) which are to be submitted on Crowdmark. The one with the lowest grade will be dropped and no late submissions will be accepted.

Tentative due dates of the problem sets are May 20, June 3, June 17, July 15, July 29, and August 12.

Term Test

The term test will begin on Wednesday, June 22 at 4 pm and last until Thursday, June 23 at 4 pm. It will be submitted on Crowdmark.

Final Exam

The final exam is scheduled to be in-person and will be held during the final assessment period in August 2022, scheduled by the Faculty of Arts and Science. Information about the format will be provided during the semester.

IV. Course Policies

Regrade Requests

Regrade requests for any piece of term work, if submitted later than a week after the date on which the grades for the assessment in question have become available on Quercus, may be denied.

Policy on Missed Term Work

As flexibility have been built into the marking scheme, late and missed problem sets will not be accepted.

A few days of extensions may be granted for the quizzes provided that absence is declared on ACORN.

Please note that Verification of Illness forms (also known as a "doctor's note") are temporarily not required. Students who are absent from class for any reason (e.g., COVID, cold, flu and other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the online absence declaration. The declaration is available on ACORN under the Profile and Settings menu.

If you miss a term test then you must inform the course instructor within 72 hours of the test (or as soon as you are physically able in the case of e.g. hospitalization) and request alternate arrangements. If your request is approved, you will receive an accommodation in the form of a re-weighting of your assessments.

Email Policy

Should you have a question that is not answered on the course site (please check there first!) please note that all communications with the Course instructor or TA's must be sent from your official utoronto email address, with the course number included in the subject line. Only personal questions should be asked via email. All math questions and all non-personal organizational questions should be asked on Ed Discussion. If these instructions are not followed, your email may not be responded to.

V. Institutional Policies and Support

Academic Integrity

You are encouraged to collaborate on problem sets, but you must write your solutions entirely in your own words and they must represent your personal understanding.

You are not allowed to collaborate on the quizzes and the term test.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters (https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to your Course Instructor. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources (for example, the University of Toronto website on Academic Integrity http://academicintegrity.utoronto.ca/).

Copyright

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.

Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor.

For questions about the recording and use of videos in which you appear, please contact your instructor.

Accessibility

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs.

Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach your Course Instructor and/or the Accessibility Services office as soon as possible. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Link to Accessibility Services website: https://studentlife.utoronto.ca/department/accessibility-services/

Important Academic Dates & Deadlines

The academic dates include enrolment dates, drop deadlines, exam periods, petition deadlines and more.

https://www.artsci.utoronto.ca/current/dates-deadlines/academic-dates