

# THEORY OF NUMBERS

Spring 2021

MATH-UA.0248-001

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<b>Instructor:</b>	Liming PANG	<b>Email:</b>	<a href="mailto:liming@cims.nyu.edu">liming@cims.nyu.edu</a>
<b>Lecture Time:</b>	Mon. Wed. 14:00 – 15:15	<b>Classroom:</b>	Online
<b>Office Hour:</b>	Wed. 09:30 – 10:30	<b>Office:</b>	Online

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**Recitation:** Friday 14:00 – 15:15 Online

**Teaching Assistant:** Tianren Qin ([tq378@nyu.edu](mailto:tq378@nyu.edu))

**TA Office Hour:** Tuesday 09:30 – 10:30

## Textbook:

David Burton, *Elementary Number Theory, 7th Edition*, McGraw Hill, 2011  
ISBN10: 0073383147  
ISBN13: 9780073383149

**Grading Policy:** Quiz (10%), Homework (20%), Midterm (30%), Final (40%).

## Exam Schedule:

Quiz 1 .....	Mar 05 2021
Midterm .....	Mar 22 2021
Quiz 2 .....	Apr 23 2021
Final Exam .....	TBD

## Class Policy:

- Homework will be released each Thursday or Friday, and due on the following Friday. Late homework or emailed version shall NOT be accepted. One LOWEST homework score shall be dropped.
- We will use Gradescope for submission of assignments/exams.
- You may discuss with your classmates about homework, but you should write your solutions by yourself. Copying others' homework is violation of university academic integrity policy.
- If you miss any due day of assignments or exams due to emergency such as illness, the corresponding documentation proofs should be submitted no later than 24 hours after the deadline or scheduled exam time in order to apply for making up.
- We will not be able to accommodate out-of-sequence exams for purposes of more convenient travel, including already purchased tickets. Please note again the date of the exams and plan your travel accordingly.

**Integrity:** We value integrity and do not tolerate academic dishonesty. You are expected to uphold academic integrity as specified by the university and the College of Arts and Science.

## Tentative Course Outline:

- 02/01: Preliminaries
- 02/03: Division Algorithm, Greatest Common Divisor
- 02/08: Euclidean Algorithm, Diophantine Equations
- 02/10: Congruence Modulo  $n$
- 02/15: (**Presidents' Day**) No Class
- 02/17: Prime Numbers, Fundamental Theorem of Arithmetic
- 02/18: (**Legislative Day**) Distribution of Primes
- 02/22: Binary and Decimal Representation of Integers
- 02/24: Chinese Remainder Theorem
- 03/01: Fermat's Little Theorem
- 03/03: Wilson's Theorem
- 03/08: Sum and Number of Divisors
- 03/10: Möbius Inversion Formula
- 03/15: Greatest Integer Function
- 03/17: Midterm Review
- 03/22: Midterm
- 03/24: Euler's Phi Function
- 03/29: Euler's Theorem
- 03/31: Primitive Roots
- 04/05: Indices
- 04/07: Euler's Criterion
- 04/12: Legendre Symbol
- 04/14: Quadratic Reciprocity
- 04/19: (**Spring Break**) No Class
- 04/21: Perfect Numbers
- 04/26: Mersenne Primes
- 04/28: Pythagorean Triples
- 05/03: Sum of Squares
- 05/05: Fibonacci Sequence
- 05/10: Final Review