INDIAN INSTITUTE OF TECHNOLOGY GANDHINAGAR
DISCIPLINE OF MATHEMATICS

MA 623: NUMBER THEORY
Course Plan Spring 2018

Instructor: ATUL DIXIT
Email: adixit@iitgn.ac.in
Office: Academic Block 5, Room 340

PRE-REQUISITES

Basic knowledge of groups, rings, and fields; basic knowledge of real and complex analysis.

COURSE CONTENTS

- Elementary Number Theory: Divisibility, Bezout's identity, Linear Diophantine equations, prime numbers, congruences, Chinese Remainder Theorem, Quadratic Reciprocity.

- Arithmetical functions and Dirichlet multiplication, big oh notation, Euler's summation formula, average order of arithmetical functions, summation by parts.

- Chebyshev's function, the prime number theorem, Dirichlet characters, Gauss sums, Dirichlet's theorem on primes in arithmetic progressions.

  Note: Selection of the topics from above will be done at the discretion of the instructor.

BOOKS

I will use my own notes during the lectures. In addition to that, the following books are recommended.

Recommended books

1. Tom M. Apostol, *Introduction to Analytic Number Theory*, Narosa publishing house, India.

2. Ramanujachary Kumanduri and Cristina Romero, *Number Theory with Computer Applications*, Prentice Hall, New Jersey, 1998.

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<u>Reference books</u>

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1. Harold Davenport, *Multiplicative number theory* Vol. 74, Springer 2013.

2. Saban Alaca, and Kenneth S. Williams. Introductory algebraic number theory. Cambridge University Press, 2004.

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<u>LECTURES AND TUTORIALS</u>

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Lectures: Monday, Tuesday and Friday: 1:05 pm - 2 pm (Room 7/205)

Tutorials: Timing to be announced.

Office hours: Monday, Tuesday and Friday: 3 pm - 4 pm in my office 5/340

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<u>HOMEWORK</u>

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Homework problems will be given fortnightly. It is absolutely imperative to work on each of the problems assigned for homework. Discussing in a group is allowed and encouraged, however, the homework solutions must be written in your own way. Mere copying of others' work is strictly prohibited and will lead to serious consequences.

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<u>POLICY FOR EVALUATION</u>

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Attendance: 6%
4 Quizzes: 20% (Surprise quizzes may be given)
Homework: 14%
Mid-semester exam: 30%
End semester exam: 30%

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<u>GRADING RUBRIC</u>

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Relative grading policy will be followed.