

Course Objectives:

The need to protect information being transmitted electronically has transformed the importance of Cryptography. Most of the modern types of Cryptosystems rely on Number Theory for their theoretical background. This course will be an introduction to Number Theory with an emphasis on those parts that have application to Cryptography and shows how the theory can be applied to Cryptography. Number Theory, one of the oldest branches of Mathematics, is about the endlessly fascinating properties of integers. The backbone of this course will be modular arithmetic, factoring, primality testing, discrete logarithm problem, the properties of group \mathbb{Z}_n , U_n , Legendre symbol.

Speakers:

- Dr. Bibekananda Maji, IIT Indore
- Dr. Jaitra Chattopadhyay, Visva-Bharati University
- Dr. Sumit Kumar Debnath, NIT Jamshedpur
- Dr. Vikas Srivastava, IIT Madras
- Dr. Kunal Dey, University of Calgary
- Dr. Subha Sarkar, NIT Jamshedpur

Eligibility:

1. Faculty/UG/PG/Research Scholars from any Central/State/Private University or Institute.
2. Interested Participants from Industry

Organizing Committee:

- Patron: **Prof. Goutam Sutradhar**
Director, NIT Jamshedpur
- Chairperson: **Prof. Raj Nandkeolyar**
Head, Dept. of Mathematics,
NIT Jamshedpur
- Coordinator: **Dr. Subha Sarkar**
Assistant Professor, Dept. of
Mathematics, NIT Jamshedpur
- Convenors: **Dr. Sumit Kumar Debnath**
Assistant Professor, Dept. of
Mathematics, NIT Jamshedpur
- Dr. Sourav Das**
Assistant Professor, Dept. of
Mathematics, NIT Jamshedpur

Tentative Contents:

- Prime Numbers, Uniqueness of Factorization, Euclidean Algorithm, Euler's Theorem, Fermat Prime, Mersenne Prime.
- Congruences, Chinese Remainder Theorem
- Wilson's Theorem
- Primality Testing, Discrete Logarithm Problem
- Primitive Roots
- Quadratic Residues, Legendre Symbol, Jacobi Symbol, Quadratic Reciprocity Law
- Number Theoretic Function: Euler's Totient Function
- Ring, Module Theory
- Class Group, Ideal Class Group
- Affine and Projective Plane
- Introduction to Cryptography
- Lattice Based Cryptography
- Isogeny Based Cryptography

A Short-Term Course on Introduction to Number Theory and Cryptography

(ONLINE MODE)

August 05-09, 2024

Last date of application: July 20, 2024



Organized by

**Department of Mathematics
National Institute of Technology
Jamshedpur - 831014
Jharkhand, India**

Local Organizing Committee:

Prof. Ramayan Singh
Dr. Sunil Kumar
Dr. Raj Nandkeolyar
Dr. Shakti Prasad
Dr. Ratnesh Kumar Mishra
Dr. Rajat Tripathi
Dr. Snehasish Kundu
Dr. H. S. Prasad
Prof. Tarni Mandal
Dr. Dibakar Dey

General Information:

Jamshedpur is the first well-planned industrial city of India, founded by the late Jamshedji Nusserwanji Tata and ranks 28th among the 35 million-plus cities and is also the 31st urban agglomeration in India according to the census 2001. Located in the East Singhbhum district of Jharkhand on the Chota Nagpur plateau, it is the district headquarters and is surrounded by the beautiful Dalma Hills. The rivers Subarnarekha and Kharkai border the North and West of the city, respectively. The institute is located in Adityapur town of the district which is at the border of Saraikela-Kharswan

Registration Fee:

Overseas Participants	US \$100
Faculty	INR 700
Participants from Industry	INR 700
Students	INR 300

*This Registration fee includes the online participation in the Short-Term Course. After successful completion of the course all the registered Participants will get a certificate.

Registration Process:

Step I: Pay the required fee in the following account and after successful payment take a screenshot containing transaction id.

Account Name: Research and Consultancy NIT Jamshedpur

Account Number: 38246478714

IFSC Code: SBIN0001882

Branch: SBI, NIT CAMPUS

Step II: Fill the details in the following

Registration Link:

<https://forms.gle/1WAc2PGL8pDa9fgD8>

For further information contact

Course Coordinator:

Dr. Subha Sarkar

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