Annual Foundation School (Dec 02-28, 2024)

The **Advanced Training in Mathematics Schools** (ATM Schools) were launched by the National Board for Higher Mathematics (NBHM) in May 2004. The purpose of these schools is to provide training in core subjects in Mathematics to Ph.D. students, young researchers and teachers. The emphasis in these schools is on learning mathematics by doing it. IIT Bombay and TIFR have jointly established the National Centre for Mathematics (NCM) in 2011. The instructional schools and workshops which were earlier planned by an NBHM committee on ATM Schools are now being organised under the supervision of the Apex Committee of the NCM.

The objective is to organize quality schools which help researchers and teachers and learn advanced mathematics in an enjoyable way.

Annual Foundation Schools (AFS) in Mathematics are intensive programs designed to bring first and second-year PhD students, particularly those with diverse backgrounds, up to a common level of knowledge in core mathematical areas. These schools are organized by the National Centre for Mathematics (NCM), a joint initiative of the School of Mathematics, Tata Institute of Fundamental Research (TIFR), and the Department of Mathematics, IIT-Bombay. The aim is to prepare students for more advanced instructional programs, like the Advanced Instructional Schools (AIS), also organized by NCM.

Key aspects of Annual Foundation Schools:

- **Target Audience:**

  Primarily first and second-year PhD students, but exceptional MSc students with a suitable mathematical background may also be considered.

- **Core Subjects:**

  Typically, AFS covers nine basic subjects spread over three levels (AFS-I, AFS-II, and AFS-III), with each level building upon the previous one.

- **Focus:**

  The schools aim to provide foundational knowledge in areas like algebra, analysis, and topology, which are essential for advanced studies in mathematics.

- **Structure:**

  Each AFS involves multiple speakers delivering lectures and tutorials, often with the support of course associates.

- **NCM's Role:**

  The NCM organizes these schools to ensure a consistent standard of mathematical education across different institutions and to identify potential candidates for advanced programs.

- **Selection Process:**

  Participants are selected based on academic credentials and the potential benefit they would gain from the program.

Three research scholars

1. **Himal Prasad**
2. **Krishna Chandra Badhani**
3. **Basant Nath Goswami**

from the department got selected for one month long Annual Foundation School at IIT Jodhpur, duringDec 02-28, 2024.

National Center for Mathematics
www.ncmath.org
(A joint centre of TIFR and IIT Bombay)
Advanced Training in Mathematics

IIT Bombay

Annual Foundation School - I
at Indian Institute of Technology Jodhpur

Certificate

This is to certify that Mr. / Ms _____ Basant Nath Goswami _____

from _____ Kumaun University _____ has participated

in the Annual Foundation School - I hosted by the Indian Institute of Technology Jodhpur

from December 2 to December 28, 2024.

Dr. Kuntal Som
Organizer

Dr. Kirankumar R. Hiremath
Organizer

National Center for Mathematics
www.ncmath.org
(A joint centre of TIFR and IIT Bombay)
Advanced Training in Mathematics

IIT Bombay

tifr

Annual Foundation School - I
at Indian Institute of Technology Jodhpur

Certificate

This is to certify that Mr. / Ms _____ Krishna Chandra Budhani _____

from _____ M. B. G. P. G. College Haldwani, Nainital _____ has participated

in the Annual Foundation School - I hosted by the Indian Institute of Technology Jodhpur

from December 2 to December 28, 2024.

Dr. Kuntal Som
Organizer

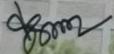Dr. Kirankumar R. Hiremath
Organizer

National Center for Mathematics
www.ncmath.org
(A joint centre of TIFR and IIT Bombay)
Advanced Training in Mathematics

IIT Bombay

tifr

Annual Foundation School - I
at Indian Institute of Technology Jodhpur

Certificate

This is to certify that Mr. / Ms _____ Himal Prasad _____

from _____ M. B. Govt. P. G. College Haldwani, Nainital _____ has participated

in the Annual Foundation School - I hosted by the Indian Institute of Technology Jodhpur

from December 2 to December 28, 2024.

Dr. Kuntal Som
Organizer
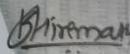
Dr. Kirankumar R. Hiremath
Organizer

Speakers and Syllabus

- **Linear Algebra and Group Theory:**

Syllabus: We will cover most of the material foundin Chapters 6,7,8 and 9 in Michael Artin's book Algebra, Pearson, 1991.
Speakers:

1. Dr. Viji Z. Thomas, Associate Professor, IISER Thiruvananthapuram
2. Prof. Anupam Singh, Professor, IISER Pune
3. Dr. Dilpreet Kaur, Associate Professor, IIT Jodhpur
4. Prof. Amit Kulshrestha, IISER Mohali

Course Associates: Lovelesh Sharma,Ratnesh Kumar Singh, Mrityunjoy Saha, Pushpendra Singh,Harish Kishnani.

References:

1. M. Artin: Algebra, 2nd Edition, Prentice Hall of India, 2011.
2. S. Lang: Algebra, Revised 3rd Edition, Springer.

- **Complex Analysis:**

Syllabus: We will cover most of the material foundin Chapters 2,3 and 4 of Stein and Shakarchi's book Complex Analysis, Princeton Lectures in Analysis- II, 2003.
Speakers:

1. Dr. Tuhina Mukherjee, Assistant Professor, IIT Jodhpur
2. Dr. Sukhendu Ghosh, Associate Professor, IIT Jodhpur
3. Dr. Kirankumar R. Hiremath, Associate Professor, IIT Jodhpur
4. Prof. G.K. Srinivasan, Professor, IIT Bombay.

Course Associates:Ratnesh Kumar Singh, Mrityunjoy Saha,Ruby,Gurubachan,Subham Garg, Sushmita Yadav, Ankit Chauhan
References:

1. Elias Stein and Rami Shakarchi: Complex Analysis, Princeton Lectures in Analysis-II, 2003.
2. W. Rudin: Real and Complex Analysis, 3rd Edition, Tata McGraw-Hill Higher Education, New Delhi, 1987.

- **Topology:**

Syllabus:We will cover most of the material foundin Chapters 1-7 of Simmons's book listed below in the references and Quotient Spaces from Chapter 4 of Armstrong's book listed below.
Speakers:

1. Dr. V.V.M.S. Chandramouli, Associate Professor, IIT Jodhpur
2. Dr. Puneet Sharma, Associate Professor, IIT Jodhpur
3. Dr. P. Veeramani, (Retd.) Professor, IIT Madras
4. Dr. Rekha Santhanam, Associate Professor, IIT Bombay.

Course Associates: Ruby,Gurubachan, Arnab Kayal, Sougata Mandal, Darshana,Sushmita Yadav.

References:

1. G.F. Simmons: Introduction to Topology and Modern Analysis, McGraw-Hill,1983.
2. M. A. Armstrong: Basic Topology, Springer.
3. J. R. Munkres: Topology, A First Course, PHI, New Delhi, 1987.