

# National Centre for Mathematics

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(A joint centre of TIFR and IIT Bombay)



## Online Teacher's Enrichment Workshop (TEW) on Functional Analysis

at *Department of Mathematics, University of Kashmir, Srinagar (J&K)*

(November 28 – December 12, 2021)

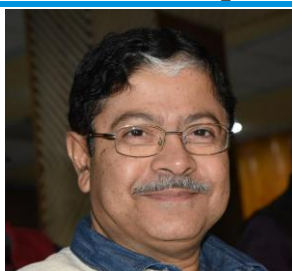
The Department of Mathematics, University of Kashmir, Srinagar in collaboration with the National Centre for Mathematics-(NCM), Mumbai is organizing Teacher's Enrichment Workshop-(TEW) on **Functional Analysis** during November 28-December 12, 2021. The main aim of this programme is to help teachers working in Colleges/Institutions/Universities of Jammu, Kashmir and Ladakh to learn and expose them to advanced level of mathematics from subject experts of repute. In addition to lecture sessions, there will be discussion/tutorials devoted entirely to problem solving, thus providing an opportunity to the participants to solve exercises as an important component of learning mathematics. The programme of TEW is fully funded by the National Centre for Mathematics, Mumbai.

### Topics to be covered

<b>Prof. Pradipta Bandopadhyay</b>	A quick Introduction to Banach spaces and bounded linear maps, Uniform boundedness principle (with some applications to classical analysis), Open mapping theorem (Closed graph theorem), Hilbert space (orthonormal systems, orthogonal basis, bounded linear maps), Gram Schmidt orthogonalisation process (applied to certain concrete sequences in $L_2$ spaces), Projection Theorem, Riesz representation theorem for Hilbert space.
<b>Prof. Sameer Chavan,</b>	Unitary operators and the unitary group on Hilbert space, Spectral theorem for self adjoint operators, Hilbert space methods in function theory (including maximum modulus theorem), Muntz-Szas theorem for $L_2[0,1]$ .
<b>Dr. S.P.S. Kainth</b>	Arzela-Ascoli theorem, Banach-Mazurkiewicz theorem on the size of $CND[0,1]$ , Hausdorff -Alexandroff theorem: (Each compact metrics space as a quotient of the Cantor set), Banach Mazur theorem ( $C[0,1]$ as a universal separable Banach space), Computation of the dual of $C(K)$ for $K = [0,1]$ and $K =$ compact subset of $\mathbb{R}$ as a prelude to the Riesz Representation Theorem for $C(K)$ , $K$ a compact metric space.
<b>Prof. M. A. Sofi</b>	Background material and motivation, Weak, weak* topologies on Banach spaces as projective topologies, Banach - Alaoglu theorem and applications, Analytic and geometric forms of the HBT and their equivalence, Applications of HBT, Invariant form of HB-theorem, Construction of universal, finitely additive invariant measures on $\mathbb{R}$ and $\mathbb{R}^2$ .

### Speakers

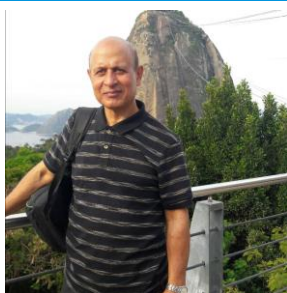
**Pradipta Bandopadhyay** is currently Professor at Theoretical Statistics and Mathematics Division, Indian Statistical Institute, Kolkata, India since June 2009. He has also held Visiting Assistant Professorship at the University of Iowa, Iowa and was also a visiting Associate Professor at Case Western Reserve University, Cleveland, Ohio, USA. He has made significant contributions in Functional Analysis involving the geometry of Banach spaces.



**Sameer Chavan** currently works at the Department of Mathematics and Statistics, Indian Institute of Technology Kanpur. He does research in Function- Theoretic and Graph-Theoretic Operator Theory. He has been actively involved in various teaching programs and Instructional Schools over the past few years.



**M. A. Sofi** works in the Department of Mathematics at the JK Institute of Mathematical Sciences (JKIMS) Srinagar where he is holding the NBHM Visiting Professorship since Oct.2020. Earlier he was teaching as an adjunct faculty at the Central University of Kashmir, Srinagar and as Emeritus Professor at Kashmir University, Srinagar after completing 32 years of active service at AMU, Aligarh and Kashmir University, Srinagar. He was awarded the Ramanujan Prize in 2009. His research interest is Functional Analysis where he is mainly interested in finite dimensionality phenomena and extension of nonlinear maps in Banach spaces.



**S.P.S. Kainth** works as Assistant Professor in the Department of Mathematics at Panjab University, Chandigarh. His research interests lie in two quite different areas: Integration theory and Graph theory. In integration theory, he works on the problems related to gauge integrals given by Henstock-Kurzweil and McShane. In graph theory, his work has led to an important breakthrough on the SIG-dimension conjecture. Presently, he is writing a book on Metric Spaces which is designed to act as gateway into the abstraction of Analysis and Topology.



### Link for the Registration:

<https://www.atmschools.org/school/2021/TEW/fa/application-form>

Last Date: **November 25, 2021**

URL: <http://maths.uok.edu.in>

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