



MANIPAL UNIVERSITY
JAIPUR



Committee for
Women in Mathematics



सत्यमेव जयते
Government of India
National Board for Higher Mathematics

**Winter School in Mathematics for Women Students
IWM Workshop at Manipal University Jaipur
March 20-26, 2021
(Hybrid Mode)**

Main Topics: Analysis, Linear Algebra, Differential Equations

1. Analysis: Prof. B. V. Limaye (IIT Bombay)

1. Real numbers. Functions and their geometric properties.
2. Sequences and their convergence, Subsequences, Bolzano-Weierstrass Theorem.
3. Continuity of a function of a real variable. Extreme Value Property and Intermediate Value Property of a continuous function.
4. Limits of functions of a real variable.
5. Differentiability and Caratheodory lemma, Chain Rule.
6. Rolle Theorem, Lagrange Mean Value Theorem and its Applications.

Prof. R. Lakshmi Lavanya (IISER Tirupati)

1. Taylor Theorem
2. Global Extrema
3. Local Extrema, Points of Inflection.
4. Riemann Integral, Integrable functions.
5. Fundamental Theorem of Calculus.
6. Riemann Sums.

2. Linear Algebra: Prof. Anita Naolekar (ISI Bangalore)

1. System of Linear equations
2. Vector spaces, Linear independence, basis.
3. Linear transformations, Rank-Nullity Theorem.
4. Characteristic polynomial, eigenvalues, eigenvectors.
5. Inner product spaces.

Prof. Nandini Nilakantan (IIT Kanpur)

1. Diagonalization
2. Spectral theorems
3. Jordan forms (if time permits).

3. Differential Equations: Prof. Dhanya Rajendran (IISER Thiruvananthapuram)

1. First order linear differential equations.
2. Variable separable equations, Exact equations, Bernoulli's equation.
3. Statement of Picards' theorem (if time permits).
4. Second order linear differential equations, Solving methods.
5. Linear independence and dependence of two or more functions, nonhomogeneous equations.

(Organizing Committee)