

MA765 Fractional Differential Equations

Credit: 4-0-0-4

Approval: Approved in 2nd Senate

Prerequisites: Real and Functional Analysis

Students intended for: Ph.D.

Elective or Core: Elective

Semester: Odd/Even

Course content:

- **Basic Theory of fractional differential equations:** Definition of fractional derivative, Riemann Liouville, Caputo derivatives, Existence and uniqueness of solutions, dependence of solutions on initial conditions, General order fractional differential equations.
- **Autonomous Systems:** General theory of system of fractional differential equations, Laplace transforms method, Equilibrium points and their stability, Lyapunov method.

Text & Reference Books:

Diethlem, K., *The Analysis of Fractional Differential Equations*, Springer, 2010.

Podlubny, I., *Fractional Differential Equations*, Academic press, 1999.

Dumitru Baleanu, José António Tenreiro Machado, Albert C. J. Luo, *Fractional Dynamics and Control*, Springer, 2012.

Vasily E. Tarasov, *Fractional Dynamics*, Springer, 2010.