Semester	AUG 2022
Open to semester	5,7,11,13
Course code	**MT3144**
Course title	**Ordinary Differential Equations**
Credits	4 /
Course Coordinator & participating faculty (if any)	Steven Spallone
Nature of Course	Lectures
Pre-requisites	Real Analysis I, and a first course in linear algebra.
Objectives (goals, type of students for whom useful, outcome etc)	A standard bachelor's course in ODEs will comprise sundry methods for solving specific forms of ODEs. A standard Ph.D. course in ODEs will prove theorems about existence and uniqueness of the abstract ODE. This master's level course will bridge the gap between these approaches: the student will both learn many techniques for explicit solutions, as well as appreciation for the clarity that a theoretical framework brings.
Course contents (details of topics /sections with no. of lectures for each)	Separation of Variables, Fundamental Existence/Uniqueness Theorems, Linear ODEs, Hermite ODEs, Computing the Exponential, Complex Solutions, Asymptotic Behavior, Inhomogeneous Linear ODEs, Lipschitz Maps, Contraction Mapping Theorem, Gronwall Theory, Peano's Theorem. Time permitting: maximal interval of existence, Sturm-Liouville Theory.
Evaluation /assessment	End-Sem Examination-50% Mid-Sem Examination-50% Others-%
Suggested readings (with full list of authors, publisher, year, edn etc.)	1. An Introduction to Ordinary Differential Equations, Dover Books on Mathematics: E. Coddington (1990) Dover 2. Differential Equations and Dynamical Systems: L. Perko (2010) Springer 3. Differential Equations with Applications and Historic Notes, International Series in Pure and Applied Mathematics: George F. Simmons (1991) McGraw Hill 4. Differential Equations, Dynamical Systems, and an Introduction to Chaos: Hirsch, Smale and Devaney (2004) Elsevier Academic Press 5. Theory of Ordinary Differential Equations: Coddington and

	Levinson (1987) Tata McGraw Hill 6. Geometrical Methods in the Theory of Ordinary Differential Equations: V.I. Arnold (1988)