MATH 262: Ordinary Differential Equations

Instructor: Mike O'Neil (oneil@cims.nyu.edu)
Time and location: Mon & Wed, 9:30am - 10:45am, CIWW 312
Office hours: Thu, 11am-12pm, (or by appt), CIWW 1119

Recitation
Instructor: Vismayie Vandanapu (vv846@nyu.edu)
Time and location: Fri, 3:30pm - 4:45pm, CIWW 201

This is a first course in ordinary differential equations which will cover analytical solution methods, elementary numerical methods, and modeling. Topics to be covered include: first-order equations including integrating factors; second-order equations including variation of parameters; series solutions; elementary numerical methods including Euler's methods, Runge-Kutta methods, and error analysis; Laplace transforms; systems of linear equations; boundary-value problems. Some optional topics to be chosen at the instructor’s discretion include: nonlinear dynamics, elementary partial differential equations, Sturm-Liouville theory, and Fourier series.

Available on SpringerLink for free to NYU affiliates:

Grading: An overall numerical grade for the course will be computed from weekly homework (10%), two preliminary exams (25% each), and one final exam (40%). The numerical grade will be converted to a letter grade. Any curve in the course will only adjust letter grades higher.

Academic Integrity: Students are expected to adhere to NYU's Academic Integrity Policy:
https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/academic-integrity-for-students-at-nyu.html

Weekly topic list

Week 1: First order equations, integrating factors
Week 2: Separable systems, exact equations
Week 3: Existence, uniqueness
Week 4: Constant coefficient 2nd order systems
Week 5: Review and prelim exam 1
Week 6: Variation of parameters, series solutions
Week 7: Laplace transforms
Week 8: Coupled linear ODEs
Week 9: Eigenvalue/vector solution method
Week 10: Review and prelim exam 2
Week 11: Stability, the phase-plane
Week 12: Phase portraits, Poincaré-Bendixson
Week 13: Separation of variables
Week 14: Fourier series
Week 15: Sturm-Liouville theory