Course Information

Math 441: Differential Equations (3 credits)

Course Description:

Math 441 is a basic course in ordinary differential equations. Topics include existence and uniqueness of solutions and the general theory of linear differential equations. Treatment is more rigorous than that given in MATH 285.

Credit is not given for both MATH 441 and any of MATH 284, MATH 285, and MATH 286. For more details see http://catalog.illinois.edu/courses-of-instruction/math/

Prerequisites: MATH 241, MATH 347, or MATH 348 is recommended.

Course Objectives

The course covers first seven chapters of the text Elementary Differential Equations and Boundary Value Problems by William E. Boyce and Richard C. Diprima. Students will develop a working vocabulary for talking about ODEs and learn different methods for solving ODEs. They will also learn applications in the physical systems such as mechanical oscillators, population models, etc. It is important to recognize that reading a head in the textbook before viewing class videos will make the lectures more comprehensible and writing your homework solutions in your own words improves your understanding.

Course Content

1. First Order Differential Equations, Integrating Factor, Separable Equations, Exact Equations, Singular Solutions, Substitution Methods, Theorem of Existence and Uniqueness.


5. Power Series Method for ODEs, Absolute Convergence, Ratio Test, Radius of Convergence for ODEs, Series Solution Near Ordinary Point, Regular and Irregular Singular Points.

Format

- This is an online course featuring video lectures from the UIUC Summer 2017 course taught by Lecturer Aldo Manfroi.


- Students must be able to print out assignments, write out solutions, then scan their written work and upload it to Moodle.

- This course requires multiple paper-based exams that must be taken with an approved proctor. Exams may be taken on campus with NetMath proctoring; for off-campus options see https://netmath.illinois.edu/offcampus. Off-campus proctors must be able to scan completed exams and email them to NetMath for grading, as well as mailing the paper exam back for archival purposes.