

Course Instructor: Dr. Zdeňka Guadarrama

Meeting Times: TR @ 11:0-12:15 (SCI 205)

Office: Science Center120-F

Office Phone: 816-501-4526

E-mail: guadarrama@rockhurst.edu

Website: <http://rumathphysics.org/guadarrama/differentialequations.html>

Office Hours: Monday, Wednesday and Friday 9:00-10:00, Thursday 10:00-11:00, or by appointment via e-mail.

Text: Differential Equations (3rd Edition) by Blanchard, Devaney and Hall.

Course description (catalogue)

This course is a dynamical systems approach to the study of solutions to differential equations. Some analytical solution techniques are covered, but emphasis is placed on qualitative, geometric and numerical techniques of finding solutions.

Objectives

- Understand the meaning of the variables and parameters in a differential equation and be able to interpret this meaning in terms of a particular model.
- Formulate differential equations and be able to interpret their solutions.
- Develop the student's ability to write, read, present and discuss mathematics.

Grading

2 in-class test with corrections	30%
HW, quizzes, etc.	40%
Design of test questions	10%
Final (Tuesday, December 8, 10:30 -12:30)	20%

Border lines for grading

A 93.3%	B+ 86.7%	C+ 76.7%	D+ 66.7%
A- 90%	B 83.3%	C 73.3%	D 63.3%
	B- 80%	C- 70%	F <63.3%

Late assignment submission policy

Any late assignment submissions incur a 50% deduction penalty.

The latest possible date to submit an assignment is the minimum of the following two times:

- time it takes me to return the assignment graded
- one week after the official due date

Make-up and policy

A make-up exam will only be considered if you notify your instructor within 24 hours of the beginning of the exam that you missed. If you schedule a make-up exam and miss your appointed make-up time then you will have no further option to take a make-up exam. There will be **no make-up quizzes**.

Tests

After I grade your test and give it back, you will have a week to come by my office during office hours and, on the board, explain to me the problems that you missed on the test. This corrections, if done well, will give you back 20% of the missed points.

Ex. Suppose you made 80/100 in Test 1. You come to my office and correctly explain all the problems you missed. Your grade for Test 1 = $80 + .2(20) = 84$.

VERY IMPORTANT NOTE

Please feel free to talk to me if you have any questions, stop by my office or send me e-mail.

Academic Honesty Policy:

Consistent with its mission as a learning community, Rockhurst has a commitment to foster an environment of academic integrity. To this end, issues involving academic dishonesty in this course will be resolved through the process outlined in the College's Academic Honesty Policy. Please refer to page 253 in the University Catalog for definitions and details about academic honesty and plagiarism.

From the Access Office:

- A. "Rockhurst University is committed to providing reasonable accommodations for students with disabilities. Please contact Sandy Waddell, Director of Access Services (Massman Hall, Room 7, 816.501.4689, sandy.waddell@rockhurst.edu) to provide documentation and request accommodations. If accommodations have already been approved by the Access Office, please communicate with the instructor(s) of this course regarding these arrangements by the second week of class in order to coordinate receipt of services."
- B. "Student contact information must be kept current in order to receive important notices from Rockhurst University. Your contact information is online via your OracleWeb account. Please check your local address, local phone number, and emergency contact information on OracleWeb and revise as needed. **All important University notices will be sent only to your RU email address.** Please check your RU email account in addition to any other email accounts you may have. Accounts are activated at the Computer Services Help Desk."

- C. "Course withdrawals are the responsibility of the student. The RU Catalog lists the procedures for a student to withdraw from one or all courses and will be upheld. If the student does not process course withdrawal(s) correctly, it will result in a failing grade."

Course Outline

Part 1

- Modeling via differential equations
- Separation of variables
- Slope fields
- Euler's Method
- Existence and Uniqueness of Solutions
- Equilibria and the Phase Line
- Bifurcations
- Applications

Part 2

- First order systems of differential equations
- Geometry of systems
- Analytic methods for special systems
- Euler's method for systems
- The Lorenz Equations
- Applications

Part 3

- Properties of Linear systems and the Linearity Principle
- Straight line solutions
- Phase planes and equilibria
- Second order linear equations
- Applications

Note

I reserve the right to make changes to the above stated policies and outline at any point during the semester if I consider it necessary. You will be notified if any changes take place.