Math 2400  Introduction to Differential Equations  Spring 2018

Lecture Time:  Tuesday, Friday, 2:00 PM - 3:20 PM

Lecture Room:  West Hall Auditorium

Instructor:  Michael Jenkinson  (jenkim2@rpi.edu)

Office Hours:  412 Amos Eaton Hall
          Tuesdays  3:30 PM - 5:00 PM
          Wednesdays  1:30 PM - 3:00 PM


Recitation Room and Time:
          Section 13: DCC 232, Monday, 10:00 AM - 10:50 AM
          Section 14: Low 4034, Thursday, 10:00 AM - 10:50 AM
          Section 15: DCC 232, Monday, 11:00 AM - 11:50 AM
          Section 16: Low 4034, Thursday, 11:00 AM - 11:50 AM

Teaching Assistant:  Yonatan Ashenafi  (ashenya@rpi.edu)

TA Office Hours:  427 Amos Eaton Hall
          Mondays  4:00 PM - 6:00 PM
          Thursdays  4:00 PM - 5:00 PM

Textbook:

Outline and Text Reading:  The following are the approximate dates for the material which we will cover. Sections in parenthesis will be covered time permitting.

2. Second Order Linear Eqns: text sections 3.1 – 3.8, 5.4; January 26 – February 23.

Grading Policy:  Attendance is not required but is strongly recommended. Homework assignments are usually suggested and not graded, unless stated otherwise. Quizzes will be given in recitation, and I will announce when they will be given ahead of time and which topics they cover. You should make sure to follow along with the suggested homework in order to keep up with the material covered in class and on the quizzes and exams. If you are unable to attend recitation for any reason, then you must make arrangements with me in advance and not after the due date.
• Quizzes (or Homework): 25% of course grade (the lowest two grades will be dropped).
• 3 In-Class Exams (tentative dates listed below): 75% of course grade, 25% each.
• Optional Final Exam (during finals week): Counts as 20% of the final grade while the rest of the assignments count as 80% (this can only help you).

Exams: Exams are given in class on the indicated date, except for the optional final which will be in a separate room to be announced. You are allowed one side of one handwritten sheet (8.5 by 11 inches) of notes. No other aids (books, notes, calculators, laptops, cell phones, slide rules, etc.) are allowed. The dates and topics below are tentative.

• **Exam 1 (2/27/2018):** first-order linear and separable differential equations; general, implicit, and explicit solutions; word problems with applications of linear first-order equations; population dynamics and graphical solution of autonomous first-order equations; second-order linear homogeneous equations with constant coefficients, solutions corresponding to real, complex, and double real roots of the characteristic equation. Method of undetermined coefficients, mechanical oscillations (free, damped, overdamped, resonantly forced, beats, driven and damped, steady solutions), Euler’s equation, variation of parameters

• **Exam 2 (3/27/2018):** 2x2 matrices and vectors, linear 2x2 systems of algebraic equations, eigenvalues and eigenvectors, 2x2 systems of linear 1st order differential equations with constant coefficients, general solutions for distinct real eigenvalues and for complex-conjugate eigenvalues, particular solutions for given initial points, plotting trajectories (phase portraits) in the phase plane, sources, sinks, saddles, centers, spiral sources, spiral sinks, stability type.

• **Exam 3 (4/24/2018):** 2x2 systems of linear 1st order differential equations with constant coefficients, general solutions for complex-conjugate eigenvalues, particular solutions for given initial points, plotting trajectories (phase portraits) in the phase plane, centers, spiral sources, spiral sinks, stability type, Fourier series (Fourier coefficients, series for odd and even functions, odd and even extensions and half-range sine and cosine series), eigenvalue problems, the heat conduction equation (separation of variables, bar with cooled ends, bar with insulated ends, solutions using eigenfunctions and Fourier series).

• **Final Exam (Week of May 7-11, TBA):** The final exam will be cumulative on the topics above. The final exam will be optional. For details on how this will factor into your final grade, see above.

**Appealing Grades:** Appealing a grade on a homework, quiz, or exam is a straightforward thing to do. Simply stop by my office during office hours and we can discuss it. However, please appeal within two weeks of receiving the graded assignment.

**Academic Integrity:** Student-teacher relationships are built on trust. Acts which violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of academic dishonesty and you should make yourself familiar with these.

Copying from fellow students' work or from unallowed aids during a quiz or an exam, as well as using electronic means, is a breach of academic integrity. If caught, you will earn 0 points for that quiz or exam. If caught again, you will be sent to the Dean of Students with the recommendation that you be expelled from the class with a failing grade. It is also strictly forbidden to resubmitt a quiz or a test for regrading with changed answers. Such behavior will be considered the highest breach of academic integrity. It will definitely land you in the office of the Dean of Students with the recommendation that you be expelled from the class with a failing grade.

Standard Institute procedure for academic integrity breaches will be followed.