Course Guide Differential Equations 334: Spring 2026: DH 4422, M-W-F 3:15-4:05 PM

Date	Topic	Lecture Notes/ Text	Assignment
M: 1-19	The Integral Curve Problem, solutions and terminology		
W: 1-21	Solutions to first order ODEs: separation of variables and linear ODEs		
F: 1-23	Solutions to first order ODEs: exact equations		
M: 1-26	Solutions to first order ODEs: substitution		
W: 1-28	Existence, Uniqueness and Visualization		
F: 1-30	Completing the square and complexification		
M: 2-2	n-th order linear ODEs, linear independence and the Wronskian		Mission 1
W: 2-4	Solution of the n-th order homogeneous ODE		
F: 2-6	Solution of the n-th order non-homogeneous via annihilator method		
M: 2-9	Motion of Springs with Friction and external force		
T: 2-11	Variation of Parameters		
F: 2-13	Cauchy Euler Problem		
M: 2-16	Questions		Mission 2
W: 2-18	Boss Fight 1 [allowed a 3x5 inch card of formulas and a non-graphing calculator]		
F: 2-20	Matrix Notation and Calculation		
M: 2-23	Matrix Notation and Calculation		
W: 2-25	Existence and Uniqueness Theory for Systems of ODEs		
F: 2-27	On the solution of Linear ODEs via real eigensolutions		
M: 3-2	On the solution of Linear ODEs via complex eigensolutions		
W: 3-4	On the solution of Linear ODEs via the matrix exponential		
F: 3-6	On the solution of Linear ODEs via the matrix exponential		
M: 3-9	Operator Technique for Systems of ODEs		
W: 3-11	The coupled spring problem		Mission 3
F: 3-13	Energy Analysis		
	March 16-20, Spring Break		
M: 3-23	Laplace Transform Technique: definition and basic rules		
W: 3-25	Assessment Day: no class.		
F: 3-27	Laplace Transform Technique: inverse transforms		
M: 3-30	Laplace Transform Technique: discontinuous functions		
W: 4-1	Laplace Transform Technique: Dirac delta function		
F: 4-3	Laplace Transform Technique: additional examples		
M: 4-6	Easter Monday		
W: 4-8	Questions		Mission 4
F: 4-10	Boss Fight 2 [allowed a pg. of notes, front and back, and a non-graphing calculator]		
M: 4-13	Power Series Technique		
W: 4-15	Singular Points and the Frobenius Method		
F: 4-17	Introduction to Fourier Series		
M: 4-20	Heat Equation and its solution		

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W: 4-22	Solution of the Wave Equation		
F: 4-24	Solution of Laplace's Equation		
M: 4-27	Variational Calculus: The Euler Lagrange Equations		
W: 4-29	Variational Calculus Examples		
F: 5-1	Something Fun		
M: 5-4	Questions		Mission 5
W: 5-6	Reading Day (May 6)		
T: 5-7	Final Boss Fight (May 7, 3:30-5:30, Thursday)		

Grading: usual 1000pts scale with:

Boss Fight 1 = Boss Fight 2 = Missions = Final Exam = 250pts.

Grade Replacement Policy: the Final Boss Fight may replace the grade for Boss Fight 1 or 2 if helpful. If you miss a Mission then I used the nearest Test grade as its replacement. However, if there is no excuse for missing the Mission then you earn a zero. The Mission grade replacement is only offered in the case that you have a university approved excuse. In the event you miss both the Mission and the Test with a university approved absence or delay then those points may be transferred to the Final Exam.

Advice: There really is no substitute for working through the Missions. They cannot be done quickly. They will required sustained effort over several days for best results. If you understand the Missions then the Boss Fights should be unsurprising. Once the solution to the Mission is posted submissions are no longer accepted. Otherwise there is a 10pt per day late penalty. It is best practice to turn them in at the start of class when they are due. It is poor form to be completing the Mission as class begins. I do not take off points for missed classes, but you should come to class and pay attention for best results. If you plan to work on other classes during my class then please do not attend.

Formatting of Missions: please follow instructions. Print name means to print your first and last name as they appear in Canvas. I expect a single, well-placed staple in the upper left corner. There should only be work on one-side of the paper. This goes for the attached work as well as the Problem Sheet you need to print out. Notice that I have instructed you to show complete solutions for some problems, so it is important that you print out the Mission for the sake of the grader and for the sake of you earning the 5pts for formatting. Finally, if in doubt, ask. My email is jcook4@liberty.edu. (Canvas Messaging does not work well, please use email instead)

Bonus Points: it is possible to earn bonus points for pointing out errors in the lecture notes. However, to earn these points a screen shot and description of the problem must be emailed to jcook4@liberty.edu. These points are not in-play until classes start, I need to edit the notes before you all spend time reading them too much.