

**Faculty of Science Course Syllabus Fall 2020** (revised June 2020)**Department of *Mathematics****MATH 2120**Ordinary Differential Equations**Fall 2020*

**Instructor(s):** David Iron      *iron@mathstat.dal.ca*    Office hours: Mondays and Tuesdays 1:30 to 3 (In my office Chase 322 or by room set up in Collaborate Ultra)

**Lectures:**      Lectures held online Tuesday and Thursday 11:35-12:55. Lectures will be recorded and available on line.

**Laboratories:** None

**Tutorials:**      None

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**Course Description**

*A comprehensive introduction to the theory of ordinary differential equations (ODEs), which is a broad field in pure and applied mathematics with numerous applications in other sciences. The topics include: special types of ODEs of 1st order, homogeneous and inhomogeneous linear ODEs with constant coefficients, Laplace transforms, systems of ODEs.*

**Course Prerequisites**

*MATH 1010.03* or permission of the instructor

**Course Exclusion****Learning Objectives**

- *First order problems - chapter 1*
- *Higher order linear problems - chapter 2*
- *Linear systems - chapter 3*
- *Laplace transforms - chapter 6*
- *Nonlinear systems - chapter 8*

**Course Materials**

- *Text: Notes on Diffy QS, Jiri Lebl*
- *A free version is available here*
- *<http://www.jirka.org/diffyqs/>*

**Course Assessment**

Component	Weight (% of final grade)	Date <sup>1,2</sup>
<i>Assignments</i> <sup>3</sup>	40%	<i>Listed on timetable</i>
<i>Tests/quizzes</i> <sup>4</sup>	60%	<i>October 15, Nov 19, Dec 10</i>
<i>Final exam</i> <sup>4,5</sup>		<i>None</i>

• **Assignments are given online using Brightspace. Assignments will open on Monday noon and close 6pm on the given due date.**

• **Quizzes. There will be 3 in-class quizzes held on Webwork. Textbook, course notes and calculators are not permitted. The quiz will be made available at the start of class time on Brightspace and close at the end.**

**Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale**

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

**Course Policies**

- Late assignments will not be accepted.
- A missed quiz cannot be written at another time. If you miss the quizzes without prior permission, it will be counted as 0. Exceptions are made in the case that you have an officially valid excuse such as a medical doctor's note (you must notify the instructor prior to the quiz (minimum of one hour), and provide a medical note).

**Course Content**

week of Sep 7 First-order differential equations, basic methods - sections 1.1 - 1.4  
 week of Sep 14 More methods and more complex equations - sections 1.5 – 1.8  
 Assignment 1 due September 17  
 week of Sep 21 Second order linear equations - sections 2.1-2.3  
 week of Sep 28 Applications of higher order equations - sections 2.4 -2.6  
 Assignment 2 due October 1  
 week of Oct 5 Systems of ODEs - section 3.1-3.4  
 week of Oct 12 More advanced topics in system - section 3.5-3.7  
 Assignment 3 due October 22  
 week Oct of 19  
 week of Oct 26 Completion of linear systems - section 3.8-3.9  
 Assignment 4 due October 29  
 week of Nov 2 Laplace Transforms I - section 6.1-6.2  
 week of Nov 9 Reading Week  
 week of Nov 16 Laplace Transform II - sections 6.3-6.4  
 Assignment 5 due November 19  
 week of Nov 23 Nonlinear systems, equilibria and stability - sections 8.1-8.2



week of Nov 30 Nonlinear models - sections 8.3-8.4

Assignment 6 due Dec 3

week of Dec 7 Nonlinear models – section 8.5