MATH 315-02 Differential Equations (Fall 2018)

Lynn Schreyer MWF 1:10-2:00pm; Fine Arts Center 5062

Course ID: 102560

Office: Neill Hall 225

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Office Hours:

Office hours for this class will be:

Tues, 2-3:30pm Neill Hall 225

Thursday 2-3:30pm Math Learning Center (Cleveland 130)

Xxxxx Teaching Assistant

You may attend *any* of the office hours listed in the Office Hour file (a separate file available on in Blackboard), unless you wish to discuss grades. To discuss a specific homework grade, please see your appropriate teaching assistant. To discuss exam or course grades, please see your instructor. *Please also feel free to go the MLC at other times, but it may take a few tries to find times when there is a MLC staff who will be able to assist you.*

Textbook: *Notes on Diffy Qs* Jiri Lebl, Brtdopm 5.3, 2018. This is a book that is made freely available by the author at: https://www.jirka.org/diffyqs/. Although you could print out this book, you could save yourself a lot of trouble and buy a paper-back version for about $16 from Amazon (probably is cheaper as you don't have to pay for the paper or ink).

Math Learning Center: Successful students make use of available resources, so don't struggle when help is just a few steps away! We want you to succeed, we're here for you, and we have FREE tutoring available in the Math Learning Center (Cleveland 130) and the computing lab, Thompson Hall (Room 1).

http://www.math.wsu.edu/studyhalls/welcome.php

Math Learning Center (MLC) Cleveland 130 Hours:

Sun: 4-9pm

Mon-Thurs: 10am-9pm
Fri: 10am-5pm

Thompson Hall Computer Lab (Thompson room 1) Hours:

Sunday: 4-9pm
Mon-Thurs: 3-9pm

Topics: Math 315 is a 3-credit course that provides an introduction to the subject of ordinary differential equations (ODEs) and includes direction fields, classification of ODEs, solution methods for first-order ODEs (including linear, separable, autonomous, and exact equations); solution methods for second-order linear ODEs; and general theory of higher-order linear differential equations. In addition, the course provides an introduction to Laplace transforms and systems of first-order linear equations. The subject matter is drawn from Chapters 0-3, and 6 from our textbook.

Prerequisite: MATH 273 (Calc III) with a C or better or Math 283 (Honors Calc 3) with a C or better; and MATH 220 (Introductory Linear Algebra) with a C or better or concurrent enrollment or MATH 230 (Honors Introductory Linear Algebra) with a C or better or concurrent enrollment. In general, students who have a B- or better in the prerequisite courses statistically pass MATH 315 at a much higher rate.

Expected Learning Outcomes and Methods of Evaluation
It is expected that students will be able to classify and solve initial value problems covered in the course material, understand when an initial-value problem is guaranteed to have a solution, analyze the solution using appropriate methods, relate some problems as models for real-world problems, and be able to explain in writing their approach to solving the problem in a manner that is accessible to classmates. Assessment will be determined by a combination of homework, projects, and exams as follows.

Grading:

The course grade will be based on weekly assignments (homework), two midterm exams, and a comprehensive final exam. Grades will be posted on Blackboard. *It is the student's responsibility to check the grades* and if there is an error to bring it to the attention to the instructor. Only errors brought to the attention within 2 weeks of an assignment or exam returned will be considered.

The point distribution will be weighted as follows:

Homework:	25%
Test 1	20%
Test 2	20%

Projects (2)	5%
Final:	30%
Total:	100%

Your final grade will be determined on a straight scale:

90-91.9% A-	92-100% A	(A+ can not be given)
80-81.9% B-	82-87.9% B	88.0-89.9% B+
70-71.9% C-	72-77.9% C	78.0-79.9% C+
	60.0-69.9% D	
	Below 60.0% F	

For students who are borderline between two grades, attendance records will be used. Attendance will be taken randomly. For those with poor attendance, the above cut-offs will be strict.

Exam Schedule:

Test 1: Thursday Sept. 27, 6:15-7:30 (*Location to be determined*)
Test 2: Wednesday Nov 7, 6:15-7:30 (*Location to be determined*)
Final Exam: **Tuesday** Dec. 11, 7-9pm. (*Location to be determined*)

For those with a course conflict (or other documented conflict) on a night of an exam, please contact your instructor a week ahead of time. An alternate time will be made available.

No technology will be allowed on any exam. No notes or reference material allowed on the two midterms. A cheat sheet will be allowed on the final.

Assignments

Assignments for each week (MWF) are due on the following Friday by 1:10p.m, except for the first assignment, which is due on Friday, Aug. 24, 1:10pm, which covers prerequisite material. DO NOT WAIT until the day before the assignment is due to start working on it – leave time to get your questions answered! Assignments should be neat, organized, and stapled. Your lowest 2 assignments will not be counted in the Homework score. Assignments turned in after the due date will not be accepted, except in special circumstances determined by the instructor. See *Homework Guidelines* for more information.

Expectations for Student Effort

It is expected that students will attend almost every class, and will spend 4-6

hours per week outside of class reviewing notes and working on homework and/or reviewing for exams. Students who are rusty with prerequisite material may spend 9 or more hours per week on this class. If you find yourself in this upper range, please attend office hours and get individual help – it will speed up your learning process! Do not wait until the day before homework is due to start working on it – leave time to get your questions answered!

Students with Disabilities

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center [Pullman] or Disability Services at [name of campus] address on your campus] to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center or Disability Services. For more information contact a Disability Specialist on your home campus. Contact the Access Center for more information: 509-335-3417, Washington Building 217; http://accesscenter.wsu.edu

WSU Safety Measures

Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Please visit http://safetyplan.wsu.edu and http://oem.wsu.edu/emergencies to access the Campus Safety Plan and emergency information. You should also become familiar with the WSU Alert Site (http://alert.wsu.edu) where information about emergencies and other issues affecting WSU will be found.

Academic Integrity

I encourage you to work with classmates on assignments. However, each student must turn in original work. No copying will be accepted either from a classmate or an online resource.

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) may receive an F as a final grade in this course, will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the "Contest a Charge" form available at conduct.wsu.edu.

Important Dates:
Friday Aug. 24: Last day students may add a course on-line. Classes added after this date require appropriate signatures.

Friday Aug. 31: Deadline for enrollment prior to $100 late registration fee. Last day a student may receive a refund for special course fees. Last day to add a course as audit or to change from credit to audit.

Tuesday Sept. 18: Deadline for dropping a course without record. Course withdrawals after this date are recorded on the student's transcript.

Friday Nov. 16: Deadline for undergraduate students to withdraw from a course. Withdrawals do not reduce tuition charges.

Friday Dec. 7: Deadline to change from pass/fail to a letter grade.

Wed. Dec. 19: Final Grades available.

For a complete list of dates, please see: http://registrar.wsu.edu/academic-calendar/

Tentative Schedule

Week of	**Topics**	**Notes**
Aug. 20	Ch 0: Introduction and Classification 1.1 first-order DE, Intro	S1.1: omit solutions of the form dy/dx=f(y).
Aug. 27	1.2-1.4: first-order DE: Slope Fields, Separable Equations; Method of Integrating factor; Existence and uniqueness	
Sept 3	1.5: Change of variables 1.6 Autonomous Equations	No class on Mon. Sept. 3 (Labor Day)
Sept. 10	1.7 Numerical Method: Euler's 1.8 Exact equatioms 2.1 Second-order DE Intro	

Sept. 17	2.2 2nd-order, real distinct, real repeated, complex 2.3 Higher order, linear independence, constant coeff	
Sept. 24	Catch up, Review and Test 2.4 Mechanical Vibrations	**Test 1** will cover Chapters 0, 1, 2.1, 2.2 real distinct Wed. class optional (review)
Oct. 1	2.5 Nonhomogeneous equations: Method of undetermined coefficients Variation of Parameters 2.6 Forced oscillations and Resonance	
Oct. 8	2.6 continued Project	
Oct. 15	6.1: Definition of the Laplace Transform and inverse Laplace 6.2: Solution of IVP and Heaviside function, (omit transfer function)	
Oct. 22	6.3: Convolution 6.4 Dirac delta and impulse response	
Oct. 29	3.1 Intro to Systems of First-Order DE 3.2 Review Lin Alg (on own): Matrix multiplication; Solving systems of DE; Eigenvalues and Eigenvectors 3.3 Intro to solns of systems 3.4 Homogeneous with constant coefficients using eigenvalues and eigenvectors	
Nov. 5	Catch-Up Review and Test 2 (Thurs. Nov. 9, 6-8pm)	**Test 2** will be over material covered in Chapters 2 and 6

	3.4 continued	Wed. Class Optional (review)
Nov. 12	3.5 Vector Fields for two-dimensional systems 3.6 Application	NO CLASS on Monday Nov. 12 (Veteran's Day)
Nov. 19	NO CLASSES	Fall Break
Nov. 26	Project	
Dec. 3	Review	
Dec. 10	Final Exam Week	**Final Exam:** Tues. Dec. 11, 7-9pm