MATHEMATICS 315 SYLLABUS

Course prefix and number: MATH 315
Course title: Differential Equations
Number of credits: 3
Prerequisites: MATH 273/283 with a C or better; and MATH 220/230 with a C or better or concurrent enrolment
Semester and year: Summer 2020
Required text: Jiří Lebl, Notes on Diffy Qs: Differential Equations for Engineers, version 6.0; ISBN-13 978-1-70-623023-6 (available for free at the linked website)

Meeting schedule: 12:00–1:15 pm, Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays
Building and room: Somewhere on the Internet
Instructor: Jakob Streipel
Email: jakob.streipel@wsu.edu
Office: Also somewhere on the Internet
Office hours: Mondays 3:30–4:30 pm, Thursdays 1:30–2:30 pm, Fridays 9:30–10:30 am, Zoom details on Blackboard
Teaching assistant: Hung Le
TA Email: hung.v.le@wsu.edu
TA Office hours/MLC: Mondays and Tuesdays, 9–11 am and 1–5 pm, Zoom details on Blackboard.

Student Learning Outcomes and Assessment

Students will be able to classify and solve initial-value problems, understand when such a problem is guaranteed to have a solution and when such a solution is unique, describe simple physical systems using ordinary differential equations, and convert higher order differential equations into systems of first order differential equations so that numerical techniques can be used.

These outcomes will be evaluated by regular homework and occasional test and a project.

Toward these outcomes students are expected to spend perhaps 6 hours per week outside class on homework, reading, and other studying outside of class. Students who feel rusty on the prerequisites might wish to spend more than this.

In class, please ask questions (or ask me to repeat myself) if ever you are confused. If you don’t, I have no way of knowing if you’re not following along!

Week-to-Week Course Outline

There will be no class on Friday, July 3rd, in observance of Independence day on July 4th.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics being discussed</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of differential equations, linearity, classification, separable ODEs, integrating factor, existence/uniqueness of solution</td>
<td>0, 1</td>
</tr>
<tr>
<td>2</td>
<td>Change of variables, autonomous ODEs, numerical methods, exact equations</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Linear higher order ODEs with constant coefficients, undetermined coefficients, variation of parameters, mechanical vibrations, nonhomogeneous ODEs</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Forced oscillations, resonance, systems of first order ODEs</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Laplace transforms, power series methods</td>
<td>6, 7</td>
</tr>
<tr>
<td>6</td>
<td>Power series methods, optional presentations</td>
<td>7</td>
</tr>
</tbody>
</table>

This schedule is very much tentative and a very rough outline. There is every possibility that some topic runs a bit short and another runs a bit long, both based on the progress we are making and on what students are interested in, et cetera.
DESCRIPTION OF REQUIRED ASSIGNMENTS

There will be homework assignments roughly twice per week (probably due Tuesday and Friday nights, but this is up for discussion), worth a total of 40% of the final grade. There will also be one midterm test in-class (or during class time, rather), around the middle of the course (probably on a Friday) worth 40% of the final grade. In addition there will be a final project and optional presentation worth 20% of the final grade, consisting of learning about one or more of the topics not covered in class, writing a short report. More information on the project will be distributed during the course.

I expect homework assignment, the test, and project reports to be written clearly and legibly. Writing in full sentences is encouraged, as opposed to a disconnected collection of mathematical expressions and equations.

The homework assignments and the test will be submitted online via Crowdmark, accessed through Blackboard.

COURSE STATEMENT ON COLLABORATION

You are welcome to collaborate, work together, ask each other questions, and seek help with homework and projects, however whatever final product you turn in must be your own work (which also includes understanding the mathematics you’re turning in). If you get help from a person, website, book, etc., give credit where due and cite that source! You will not be penalised for seeking and receiving help honestly (but you may be penalised for doing it dishonestly, is the point).

No collaboration will be allowed on the test.

GRADING POLICY

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Guaranteed grade</th>
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<tbody>
<tr>
<td>[93, ∞)</td>
<td>A</td>
</tr>
<tr>
<td>[90, 93)</td>
<td>A−</td>
</tr>
<tr>
<td>[87, 90)</td>
<td>B+</td>
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<tr>
<td>[83, 87)</td>
<td>B</td>
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<tr>
<td>[80, 83)</td>
<td>B−</td>
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<tr>
<td>[77, 80)</td>
<td>C+</td>
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<tr>
<td>[73, 77)</td>
<td>C</td>
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<tr>
<td>[70, 73)</td>
<td>C−</td>
</tr>
<tr>
<td>[60, 70)</td>
<td>D</td>
</tr>
<tr>
<td>[0, 60)</td>
<td>F</td>
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</table>

“Guaranteed grade” means a score very close to a cutoff is likely to be rounded up. Notably I also reserve the right to be kind; for instance, if it appears as though a given problem was universally misunderstood or more difficult than anticipated, chances are I will lower the cutoffs accordingly.

POLICY FOR LATE ASSIGNMENTS

Assignments will always be turned in electronically, and there will always be a posted deadline. Late assignments will receive a score of 0 unless there is good reason (and you let me know in advance).

ATTENDANCE POLICY

There is none. Come and go as you please; we are all adults. I do believe class is valuable and useful, however.

WSU REASONABLE ACCOMMODATIONS STATEMENT

“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 at 509-335-3417, Washington Building 217, http://accesscenter.wsu.edu, Access.Center@wsu.edu to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist on your home campus.”
WSU Religious Accomodation Statement

“Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104 — Academic Complaint Procedures.”

WSU Academic Integrity Statement

“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) will receive scores of zero (0) on the assignment or test in question, 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 form available at conduct.wsu.edu.”

Safety and Emergency Notification

“Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the ‘Alert, Assess, Act,’ protocol for all types of emergencies and the ‘Run, Hide, Fight’ response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSES your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at myWSU. For more information on this subject, campus safety, and related topics, please review the FBI’s Run, Hide, Fight video and visit the WSU safety portal.”