MAP 2302
SUMMER A 2025

SYLLABUS

COURSE TITILE: Elementary Differential Equations

CATALOG DESCRIPTION: First-order ordinary differential equations, theory of linear ordinary differential equations, solution of linear ordinary differential equations with constant coefficients, the Laplace transform and its application to solving linear ordinary differential equations.

PREREQUISITES: MAC 2312 or MAC 2512 or MAC 3473 with a minimum grade of C.

Attributes: General Education - Mathematics

COURSE CONTENT: MAP 2302 is designed to serve the students in engineering, physics, and mathematics. The course gives the fundamental knowledge necessary for understanding and solving ordinary differential equations of the most basic types and applying this knowledge to real life phenomena.

In Summer A 2025, you are assigned to the following course meeting time:
MAP 2302 0139 (11276) ELEM DIFF EQUATIONS MTWRF 3 LIT 207

INSTRUCTOR: **Dr. Larissa Williamson**
Office: LIT 380
Office Hours: In-person: M, W: 12:30 pm – 1:45 pm
F: 9:30 am – 10:45 am
or by Appointment (via Zoom or in-person)
E-mail: lwill@ufl.edu
Webpage: https://people.clas.ufl.edu/lwill/

A request for an Office Hour Appointment must be sent at least 48 hours in advance.

E-MAIL: The **instructor** will communicate with the students and reply to ALL email messages received from the students ONLY via Canvas **Inbox** tool.

The Course Management System is E-Learning (Canvas): https://elearning.ufl.edu/

General Education Credit

- **Mathematics**

This course accomplishes the General Education objectives of the subject area listed above. **A minimum grade of C is required for General Education credit**. Courses intended to satisfy General Education requirements cannot be taken S-U.
At the end of the course, the students are expected to have achieved the General Education Student Learning Outcomes (SLOs), which are listed on the last page of this syllabus.

Delivering Content

TEXTBOOK & ACCESS CODE: We use the following textbook in this course:

Fundamentals of Differential Equations and Boundary Value Problems, 7th edition, by R. Kent Nagle, Edward B. Saff, and Arthur D. Snider*

Access code to **MyLab and Mastering** is required in the course. **Access code can be obtained through UF All Access program by authorizing charges to your student financials account and is provided at a reduced price.** ** This option will become available starting one week prior to the beginning of the semester.
If you do not wish to authorize charges to your student financials account, you may purchase access code at the Campus bookstore instead (https://www.bkstr.com/floridastore), which will be more expensive than opting-in.

* Registration with MyLab gives you an access to an electronic version of the textbook. If you wish to have a printed text, you may purchase it at the bookstore.
****Please see "Course Materials & Registration Instructions" on E-Learning (Canvas) for complete information on obtaining access code through UF All Access and registration with Pearson's MyLab and Mastering.**

LECTURE NOTES: Lectures in this course are delivered using Lecture Note shells which can be printed from the Canvas page Lecture Notes. Lecture note shells make note taking easier and are recommended in the course. The students will be informed prior to the beginning of the term whether the whole set of Lecture Note shells (Course Pack) is available for purchase at Target Copy (1412 W University Ave, Gainesville, FL 32603, http://target-copy.com/).
The completed lecture notes will be posted on Canvas after each lecture.

TEXTBOOK READINGS: Reading the textbook is a part of the learning process. The students are strongly recommended to read the corresponding sections of the textbook after (or before) attending a lecture and before doing homework on MyLab (see ONLINE HOMEWORK in this Syllabus). The sections of the textbook that match the content of the Modules are listed on the next page of this syllabus.

The Course materials are divided into **3 Units** with a total of **23 Modules**:

Unit 1:	M00 – M09	First Order Differential Equations
Unit 2:	M10 – M15	Linear Differential Equations
Unit 3:	M16 – M22	Laplace Transform & Power Series Solutions

Course Content and Module Coverage

Unit 1: First Order Differential Equations

M 00	Review of Integration
M 01	Solutions & Initial Value Problems (Sections 1.1, 1.2)
M 02	Direction Fields & Euler's Method (Sections 1.3, 1.4)
M 03	Separable Equations & Applications (Sections 2.1, 2.2)
M 04	Linear Equations & Bernoulli Equations (Sections 2.3, 2.6)
M 05	Exact Equations & Integrating Factors (Sections 2.4, 2.5)
M 06	Substitutions & Transformations (Section 2.6)
M 07	Mathematical Modeling (Sections 3.1, 3.2)
M 08	Newtonian Mechanics & Electrical Circuits (Sections 3.4, 3.5)
M 09	Numerical Methods (Sections 3.6, 3.7)

Unit 2: Linear Differential Equations

M 10	Homogeneous Linear Equations (Sections 4.1, 4.2)
M 11	Auxiliary Equations with Complex Roots & Mass-Spring Systems (Section 4.3)
M 12	Nonhomogeneous Linear Equations & Undetermined Coefficients (Section 4.4)
M 13	The Superposition Principle & Variation of Parameters (Sections 4.5, 4.6)
M 14	Variable Coefficient Linear Equations (Section 4.7)
M 15	Closer Look at Mechanical Vibrations (Sections 4.9, 4.10)

Unit 3: The Laplace Transform & Power Series Solutions

M 16	Definition & Properties of the Laplace Transform (Sections 7.1, 7.2, 7.3)
M 17	Derivatives & the Inverse Laplace Transform (Sections 7.3, 7.4)
M 18	Initial Value Problems & Transf. of Discontinuous Functions (Sections 7.5, 7.6)
M 19	Transforms of Periodic and Power Functions & Convolutions (Sections 7.7, 7.8)
M 20	Impulses & Dirac Delta Function (Section 7.9)
M 21	Power Series & Analytic Functions (Sections 8.1, 8.2)
M 22	Power Series Solutions to Linear Differential Equations (Sections 8.3, 8.4)

MAP 2302 - Course Calendar

Summer 2025	Monday	Tuesday	Wednesday	Thursday	Friday
May	12 M1 L	13 M2 L	14 M3 L	15 M4 L	16 M5 L
	19 M6 L HW M0-M4 due **Quiz1: M1-M4**	20 M7 L	21 M8 L	22 M9 L	23 Review1 L HW M05-M08 due **Quiz2: M5-M8**
	26 Holiday	27 HW M09 due **Exam1: M1-M9**	28 L10	29 M11 L **Project due**	30 M12 L
June	2 M13 L HW M10-M12 due **Quiz3: M10-M12**	3 M14 L	4 M15 L	5 M16 L	6 M17 L HW M13-M15 due **Quiz4: M13-M15**
	9 M18 L	10 M19 L	11 M20 L	12 Review2 L HW M16-M19 due **Quiz5: M16-M19**	13 HW M20 due **Exam2: M10-M20**
	16 M21 L	17 M22 L	18 Review3 L HW M21-M22 due **Quiz6: M21-M22**	19 Holiday	20 **Final Exam** M1-M22

Assessments

ONLINE HOMEWORK: Each online **Homework assignment** (HW) is a set of problems assigned in MyLab and numbered according to the Module covered. Each homework assignment is due at 11:59 pm on the due date – the due dates are listed on the Course Calendar, on Canvas, and in MyLab and Mastering. **A HW will be closed after the deadline and cannot be re-opened without a legitimate reason**. Credit for a HW will be given according to the percentage value of the correct work completed. Review of a completed HW after the deadline will become available via MyLab gradebook – a non-attempted HW cannot be reviewed.
Each HW assignment is worth 5 points. There will be a total of 23 HW assignments offered, and the **three lowest scores will be dropped** at the end of the term.

LECTURE PARTICIPATION: Starting with M03 lecture (after the drop-add period ends), **Lecture Participation** (LP) will be taken during each class meeting except on the days of the exams, and the points will be given for attendance. A total of 23 sessions will be graded. Each session is worth 2 points. Unexcused absence will result in a zero. **The three lowest scores on the LP will be dropped** at the end of the term.

ONLINE QUIZZES: There will be **six Quizzes** (Q) offered in MyLab – the quizzes are mandatory but not proctored – they are "open note" quizzes. The Quizzes must be taken from within MyLab and Mastering on the dates indicated in the Calendar: each Quiz opens at 12 am and closes at 11:59 pm on the same day. The time allowed is 40 minutes. A Quiz will be graded out of 20 points (no bonus). Review of a completed Quiz will become available after the deadline and can be accessed from MyLab gradebook. **The one lowest score on the Quizzes will be dropped** at the end of the term.

EXAMS: There will be **two Midterm Exams** and the **Final Exam** offered during the regular class time on the dates indicated in the course Calendar.

The **midterm Exams** are all free-response questions and will be hand-graded on a scale from 0 to 60. There will be 8 bonus points available on each Exam. You must show all work on a midterm Exam to receive a full credit.

The mandatory Final Exam is cumulative: it covers M1-M22. The Final Exam will be given on the last day of classes during the regular class time. It will be graded out of 60 points. There will be 17 multiple-choice questions at 4 points each, which includes 2 bonus questions.

MATLAB PROJECT: A Project on Numerical and Graphical solutions to some problems that are considered in the course will be offered at the beginning of the term with the due date indicated in the Course calendar. The Project is worth 40 points. All work must be done in MATLAB application, which can be accessed via UF Apps.
Note: The students are not required to write the MATLAB codes themselves – they will be using sample codes presented by the instructor.

For more information on the Project, please visit the link "MATLAB Project" on the Canvas course homepage.

Software Policy

Scientific calculators are required in the course and on the Exams.
A graphing calculator is needed for some homework problems, but it can be replaced with suitable software, such as MATLAB, which is available via UF Apps.
Graphing calculators are not allowed on Exams.

Makeup Policy

MAKEUP POLICY ON ONLINE HOMEWORK, QUIZZES & ATTENDANCE**:** If you are not meeting the deadline for a Homework Assignment or a Quiz or missing a lecture on a **legitimate reason** (being sick, being away on a UF business, family emergency, religious holiday), you may send an email to Dr. Williamson via **Canvas Inbox** either prior to the deadline or within one (1) day after the deadline and request an extension or a make-up – **a reason for the request has to be clearly specified and the Instructor may request documentation**.
Late requests/documentation will not be accepted!

MAKEUP POLICY ON EXAMS: If you are missing a midterm Exam due to a **legitimate reason** (being sick, being away on a UF business, family emergency, religious holiday), you can send an email to Dr. Williamson via **Canvas Inbox** tool either prior to the Exam or within one (1) day after the Exam and request a make-up. **A reason for the request must be clearly specified and the instructor may request documentation.**
Late requests/documentation will not be accepted!
Missing a midterm Exam without a legitimate reason and taking a make-up later will result in removing the bonus points opportunity and, additionally, applying a 5-point penalty. The request for a make-up must be sent no later than within one (1) day after the Exam.

IMPORTANT: You can discuss with your Instructor a midterm Exam, Quiz, HW, and MATLAB Project **within one (1) day** and the Final Exam – **within the same day** upon receiving the grades if there is a grading error or any other problem**.**
Late requests will not be accepted!

All issues with Canvas, MyLab & Mastering, UF Apps/MATLAB must be reported immediately and documented when sending a request for an extension or retake.

Grade

COURSE GRADE: The course grade is assigned based on the students' performance on the following weighted categories:

			Totals:	
20	Lecture Participation	@ 2 points	40 points	8.70 %
20	Online Homework	@ 5 points	100 points	21.74 %
5	Online Quizzes	@ 20 points	100 points	21.74 %
1	MATLAB Project	@ 40 points	40 points	8.70 %
2	Midterm Exams	@ 60 points	120 points	26.08 %
1	Final Exam	@ 60 points	60 points	13.04 %
		Grand Total:	460 points	100 %

The course grade is the grade satisfying the conditions below and **will be adhered** to:

	Minimum %		**Minimum %**
A	90 %	C	66 %
A-	86 %	C-	62 %
B+	82 %	D+	58 %
B	78 %	D	54 %
B-	74 %	D-	50 %
C+	70 %	E	0 %

Note: We have 0.5% round up margin towards a higher letter grade.

GRADE POSTING: All grades will be posted in a timing manner on E-Learning (Canvas) at https://elearning.ufl.edu/. We strongly recommend verifying regularly that your grades are recorded correctly. **You should immediately report any problem with your grade to your instructor.**

Miscellaneous

Help: Please visit the *Academic Resources* website (the link is listed below) for the information on UF Help services:
https://academicresources.clas.ufl.edu/

Grades: Grading will be in accord with the UF policy stated at
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Honor Code: "UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class."

Class Attendance: "Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx "

Accommodations for Students with Disabilities: "Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/
It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester."

Online Evaluations: "Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/."

Contact information for the Counseling and Wellness Center: https://counseling.ufl.edu/ 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Student Learning Outcomes (SLOs)

At the end of this course, students will be expected to have achieved the General Education learning outcomes as follows:

- **Content:** Students demonstrate competence in the terminology, concepts, theories, and methodologies used within the discipline. After completing this course, students will be able to employ strategies in finding solutions to some ordinary differential equation and analyze and solve related applied problems. (Critical Thinking for Gen Ed Math, assessed through homework, lectures, quizzes, exams, and projects.)

- **Communication**: Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline. Throughout this course students will formulate and analyze mathematical problems by means of the differential equations and will communicate mathematical solutions clearly and effectively. (Communication for Gen Ed Math, assessed through homework, lectures, quizzes, exams, and projects.)

- **Critical Thinking**: Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods, and develop reasoned solutions to problems. In this course, students will reason in solving the first-order differential equations, linear differential equations, analyzing mass-spring systems, using Laplace Transform to solve initial value problems, and employing power series to approximate the solutions for certain types of differential equations. They will also develop and solve mathematical problems related to the real-world phenomena. (Critical Thinking for Gen Ed Math, assessed through homework, lectures, quizzes, exams, and projects.)

Assignment Category	**Short Description**	**General Education Mathematics SLOs Met**	**% of Grade**
Lecture Participation	Attendance Monitor	Communication, Content, Critical Thinking	8.70 %
Online Homework	Sets of Problems in MyLab	Communication, Content, Critical Thinking	21.74 %
Online Quizzes	Quizzes in MyLab	Communication, Content, Critical Thinking	21.74 %
Midterm Exams	In-Class Exams	Communication, Content, Critical Thinking	26.08 %
Final Exam	End-of-Term Exam	Communication, Content, Critical Thinking	13.04 %
MATLAB Project	Project on Numerical & Graphical Solutions	Communication, Content, Critical Thinking	8.70 %