Course Syllabus for Math 2090 Elementary Differential Equations And Linear Algebra

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Book:	Course Syllabus for Math 2090 Elementary Differential Equations And Linear Algebra		

Description

The *Moodle book* is a resource that can be used to organize information and multimedia in your course. Click on any of the chapter titles to jump to the section you want to read. You can print this book by clicking on the book title or on a chapter title and then clicking the link under the Table of Contents.

This course syllabus is an example of the Moodle book.

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Instructor & Course Information

Math 2090: Elementary Differential Equations and Linear Algebra (4 credit hours)

Instructor: Dr. Ameziane Harhad
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Please email your instructor or post in the Q&A forum with questions about course content. Every effort will be made to respond within two business days.

Catalog description: Introduction to first order differential equations, linear differential equations with constant coefficients, and systems of differential equations; vector spaces, linear transformations, matrices, determinants, linear dependence, bases, systems of equations, eigenvalues, eigenvectors, and Laplace transforms.

Pre-requisites: Math 1552: Analytic Geometry & Calculus II or Math 1553: Honors Analytic Geometry & Calculus II

Course Outcomes and Module Learning Objectives

This course covers the following specific measurable outcomes and learning objectives. All assessments are aligned to these outcomes and objectives.

Course Outcomes

When you complete this course, you will be able to:

1. Model, solve, and interpret first-order differential equations
2. Apply the properties of matrices to solve linear systems
3. Identify and utilize concepts of vector spaces, subspaces, spanning sets, linear independence, bases, and dimension
4. Compute eigenvalues and eigenvectors and use them to solve systems of first-order linear differential equations
5. Solve higher-order linear differential equations

Module Topics and Learning Objectives

The following is a breakdown of module topics and their associated learning objectives.

Module 1: First-Order Differential Equations

1. Classify differential equations (CO 1)
2. Determine if a given function solves a differential equation (CO 1)
3. Write differential equations that are models of real-world situations (CO 1)
4. Find position functions given acceleration functions, initial position, and initial velocity (CO 1)
5. Solve separable differential equations (CO 1)
6. Solve linear first-order differential equations (CO 1)
7. Solve applications involving separable differential equations (CO 1)
8. Solve applications involving linear differential equations (CO 1)
9. Solve exact first-order differential equations (CO 1)

Module 2: Linear Systems and Matrices

1. Solve linear systems of equations using matrices and Gaussian elimination (CO 2)
2. Use elementary row operations to find an inverse of a matrix (CO 2)
3. Evaluate determinants using cofactor expansions and properties (CO 2)
4. Use Cramer's rule to solve systems of equations (CO 2)

Module 3: Vector Spaces

1. Determine whether vectors are linearly dependent or independent (CO 3)
2. Express a vector as a linear combination of given vectors (CO 3)
3. Find a spanning set of a vector space (CO 3)
4. Determine if sets of vectors are a basis for R^n (CO 3)
5. Determine if a subset of a vector space is a subspace (CO 3)
6. Find a basis for the solution set of a given homogeneous linear system (CO 3)

Module 4: Higher-Order Linear Differential Equations

1. Determine whether functions are linearly dependent or independent (CO 5)
2. Solve homogeneous linear equations with constant coefficients (CO 5)
3. Solve homogeneous linear equations involving mass-spring-dashpot systems (CO 5)
4. Solve nonhomogeneous linear equations with constant coefficients (CO 5)
5. Use variation of parameters to solve nonhomogeneous linear equations (CO 5)

6. Solve applications involving nonhomogeneous linear equations (CO 5)

Module 5: Eigenvalues and Eigenvectors

1. Find eigenvalues and eigenvectors for a given matrix (CO 4)
2. Find complex conjugate eigenvalues and associated eigenvectors for a given matrix (CO 4)
3. Determine the eigenspaces for a square matrix and bases for each eigenspace (CO 4)

Module 6: Linear Systems of Differential Equations

1. Transform given differential equations into equivalent systems of first-order differential equations (CO 4)
2. Write systems of differential equations in matrix form (CO 4)
3. Find general solutions to homogeneous linear systems of first-order linear equations (CO 4)
4. Solve nonhomogeneous systems of first-order linear equations (CO 4)
5. Solve applications involving systems of first-order linear equations (CO 4)

Module 7: Laplace Transform Methods

1. Find Laplace transforms using the definition of the transform (CO 1, CO 5)
2. Use resources such as tables and properties of transforms to find Laplace transforms and inverse Laplace transforms (CO 1, CO 5)
3. Solve initial value problems using Laplace transforms (CO 1, CO 5)
4. Find Laplace transforms and inverse Laplace transforms of piecewise functions (CO 1, CO 5)
5. Solve applications involving Laplace transforms with piecewise functions (CO 1, CO 5)

Course Materials and Resources

Required Materials

The following materials are required for this course:

Edwards, Penney, and Calvis. *Differential Equations & Linear Algebra* (4th edition) with MyLab Math access. ISBN: 9780134497181.

You can purchase this textbook directly through the publisher Pearson. *Please note that online access to MyLab Math is required.*

Please see below for instructions for accessing your eTextbook and activities at the publisher site.

Ordering Information

Please review the following tips for ordering your course materials:

1. Do not purchase your textbooks until your enrollment is approved. During the processing period, a new section may be opened that could require a different textbook or edition.
2. Courses with special access codes require that students use the direct links to the publisher site.
3. Always order by the ISBN. Publishers and vendors often offer the same textbook title under different ISBNs. You must have the correct ISBN to access your online website.
4. If you are having problems locating a textbook, contact us at Answers@outreach.lsu.edu for assistance.

Instructions for Publisher Tools

This course requires subscription to Pearson MyLab Math (referred to by its common name, MyMathLab, in this course) for readings and completion of module activities that are linked in each module. Carefully read the following instructions for subscribing to the site and accessing your course materials.

1. Scroll down to the bottom of the Getting Started module and click on the Access Pearson link.
2. You will be prompted to register for MyMathLab access. You can use this menu to purchase access to the textbook and activities. If you purchased a textbook from a bookstore and have an unused access code, you can enter your access code on this screen.

The following video can be helpful in registering for MyMathLab from the Access Pearson link (pay attention to only the instructions related to Moodle).

Privacy and Accessibility

Please be aware that in using your Pearson course materials, certain information may be collected and used in other locations. For details, see Pearson's privacy policy.

If you have concerns about accessibility or would like to request accommodations, contact Pearson's support page. You can read about Pearson's accessibility features on their accessibility page.

Additional Materials

The following materials are suggested as supplemental to the course material:

Knowledge of calculus from your previous coursework will be useful in completing this course. If you need a refresher on concepts from calculus, please refer to calculus textbooks that are freely available on the OpenStax website and shared under a Creative Commons Attribution license.

Technical Information and Assistance

Technical Help

If you have questions about the functionality of your course, review the GROK article **LSU Online Technical Requirements** to make sure you have the right equipment and software.

If you have any technical problems or questions, email CE Learner Services at **Answers@outreach.lsu.edu** or call (225) 578-2500. Be sure to mention your name, course number, and section.

Calculator Policy

While you may use any calculator you wish on the homework assignments, you may only use either the TI-30XIIB (battery) or the TI-30XIIS (solar) with a two-line display on exams. No other calculators are allowed on exams.

Note: Photos of calculators were provided courtesy of Texas Instruments.

Grading and Course Work

This course covers an entire semester of work or the equivalent of a 4-credit hour classroom course lasting 15 weeks or 180 hours. You will find some modules are longer than others and may require more time and effort on your part. Do not expect to complete each module in a single study session. Understand, too, that if you choose to submit assignments at a very high pace, your instructor may not be able to grade your work at the same rate. In other words, if you submit multiple assignments on the same date, your instructor may be unable to provide feedback and grade all of them within the expected 7-day response time.

Your grade in this course will be determined by the specific activities and assessments described in this syllabus. You will have a checklist in each module that instructs you on how to work through the materials and activities. In the following subchapters you will find details about each type of activity and assessment, as well as the grade breakdown and grading scale. Specific expectations for each graded item are included within these subchapters. Make sure you read all of the instructions!

Grade Breakdown and Grading Scale

You must earn a passing average on the exams to pass the course.

If you earn a passing average on all exams, then your grade will be calculated as follows:

Grade Breakdown	
Homework Assignments	30%
Exam 1	20%
Exam 2	20%
Final Exam	30%

LSU Grading Scale

The following grading scale applies:

97%–100% = A+
93%–96% = A
90%–92% = A-
87%–89% = B+
83%–86% = B
80%–82% = B-
77%–79% = C+
73%–76% = C
70%–72% = C-
67%–69% = D+
63%–66% = D
60%–62% = D-
0%–59% = F

Instructional Materials

You will engage with three different types of instructional materials during the course, including textbook readings, Moodle resource books, and MyMathLab videos. Engaging with each of these materials will help ensure that you have the necessary information and practice to successfully complete the homework assignments and exams. Read more about each resource below.

Textbook Readings

In each module, you will read sections from the textbook. For your convenience, a link to the eText is provided in the Getting Started module and in each module's to-do list. Read through the assigned sections carefully, take notes as needed, and complete practice problems to ensure understanding.

Moodle Resource Books

In each module, your instructor has provided a Moodle resource book that summarizes key concepts and includes additional practice problems. The answers to these practice problems are hidden from view until you click the "Show Answer" button. Try each practice problem on your own before revealing the answer. Please note that the Moodle resource book is not a replacement for reading through the textbook sections.

MyMathLab Videos

Each module contains links to instructional and example videos that are in MyMathLab. Your instructor has organized these video links to help you review concepts and additional examples before proceeding to the homework assignments.

Homework Assignments in MyMathLab

Throughout this course, you will complete graded assignments in MyMathLab. The purpose of these activities is to give you a chance to practice the skills learned in each module and prepare for the exams in this course. There is also a calculus review that will be graded as a homework assignment.

When completing assignments in MyMathLab, each question is worth 1 point, and you may attempt each question up to 10 times. There is no time limit on each question. Some questions may grant you partial credit. The total number of points for each assignment is displayed when you open it in MyMathLab.

After you complete each assignment, submit the assignment verification that is under it. Your instructor will manually transfer the grade out of 100% from MyMathLab to your course gradebook. Each homework assignment in MyMathLab will evenly contribute to equal 30% of your overall course grade.

- *Note: Although MyMathLab displays points earned for watching videos, watching the videos will* ***not*** *affect your grade in this course.*

Some questions may allow you to use the links at the bottom of the page to help you solve the problem or view an example. Do not become overly reliant on these tools, however. If you struggle with a question, take time to learn from you mistakes before trying again. Doing this will help you be prepared for the exams later in the course.

Remember that your instructor is here to assist you with any questions that you have during the course.

Exams and Proctoring

An exam may not be taken until all of the modules covered in that exam have been completed. Exams must be taken in order (in other words, Exam 1 must be taken before Exam 2, and Exam 2 must be taken before the Final Exam), and the Final Exam cannot be taken during the first three weeks of enrollment. You must have a grade on the last assignment before the final exam.

Carefully read the following information, which is also listed in the exam modules in your course. Navigate to those exam modules when you are ready to take your exams.

Content

Exam 1 covers concepts from Modules 1-3, Exam 2 covers concepts from Modules 4-6, and the Final Exam covers concepts from throughout the course. The questions on these exams will be in a similar format to what you have seen in your homework assignments. Some questions may allow partial credit if your work is on the right track.

Preparing for Exams

To prepare for your exam:

1. Review the homework assignments from the corresponding modules. Pay special attention to questions that you struggled with.
2. Review your notes from the corresponding modules.
3. Re-read sections from the textbook or re-watch videos for concepts as needed.
4. Complete the practice exam located within the exam module. These practice exams are optional but highly recommended to help you prepare for the exams and give you the confidence you need before you begin.

Testing Rules

- Exams require all preceding module assignments to be completed and graded.
- You will have three hours to complete each exam.
- Exams will be completed under proctor supervision.
- No restroom breaks are allowed.

Permitted During Testing

- You are allowed to use either a TI-30XIIS or TI-30XIIB scientific calculator on this exam.
- You are allowed pencils and up to three 8.5" X 11" sheets of scratch paper during the exam. To verify the number of sheets and that the paper is blank, you must show your scratch paper to the proctor before you begin your exam. At the end of the exam, the proctor will instruct you to destroy the scratch paper.

Prohibited During Testing

You are not allowed to use your notes, textbook, or receive any outside assistance of any kind.

LSU Online & Continuing Education has high standards of academic integrity. The academic honesty guidelines stated in your syllabus will be strictly enforced.

To read the full exam policy and other policy statements, visit ODL's **Policy page**.

Proctoring Information: ProctorU

To take exams in this course, you will use the proctoring service ProctorU. You cannot use an account created through another university, so if you already have an account, you will still need to create an account associated with LSU Online Distance Learning (ODL). When you are ready to create your account, visit the **Louisiana State University ProctorU portal**. When you create your account, you will have access to the following items:

- *Login:* used to access your account and schedule appointments
- *Sign Up:* used to create your account and request a Login ID
- *Technical Specifications:* provides specifications and a link to test your equipment
- *How It Works:* video explaining testing process
- *Getting Started:* instructions for first time users
- *Contact Us:* provides contact information for ProctorU

The **ProctorU Live Resource Center** provides information on:

- How ProctorU works
- What to expect when testing
- Technical requirements, and more.

Exam appointments are reserved on a first-come, first-served basis. Schedule your exams as early as possible so that you can choose the times that are best for you and so you will have enough time to prepare. Please note that if you schedule your exam fewer than seventy-two hours before your chosen day and time, additional premium scheduling fees may be assessed. The ProctorU **Test-Taker Knowledge Base** contains more information about scheduling and premium fees.

Guild students: students who register through Guild will need a code to cover their testing fees. To obtain your access codes:

1. Go to “Course Tools” within your course in Moodle
2. Under “ProctorU Access Codes,” select “Claim your access code,” and then schedule your exam with ProctorU
3. Once you have used an access code, return to the same page in your course to mark your code used and to obtain a new access code for your next testing session

Proctored Exam Reviews

Students who have completed an exam and desire to review the results of their exam attempt must request an exam review. Students should follow the instructions provided in each exam module carefully in order to make sure that the exam will be available for their review appointment.

Course Policies

Carefully read the following important policies that apply to taking a course through **LSU Online Distance Learning (ODL)**. For a complete list of our program policies, visit our **Policies page**.

Engagement and Participation

Please check into your Moodle course frequently to keep track of your work. An online course requires you, the student, to be in control of your learning. In a face-to-face course, instructors can play a much bigger role in actively directing your learning, since they see you two or three times a week. In an online course, it takes a lot more work in designing an appropriate learning environment, so that you can learn at your own pace. Since you are in control, you need to be disciplined enough to complete assignments on a regular basis and stay up to date with the course.

Timely communication is an e-learning best practice. Check your email and the News and Announcements Forum on the course front page regularly to make sure you do not miss any communications from your instructor.

Academic Integrity

Academic Misconduct

Students in Online Distance Learning (ODL) courses must comply with the LSU Code of Student Conduct. Suspected violations of the academic integrity policy may be referred to LSU Student Advocacy & Accountability (SAA), a unit of the Dean of Students. If found responsible of a violation, you will then be subject to whatever penalty SAA determines and will forfeit all course tuition and fees. ODL reserves the right to deny enrollment to any applicant or to discontinue the enrollment of any student who is in violation of the ODL academic integrity policy.

To read more, please visit our **policies page**.

Plagiarism and Citation Method

Students are responsible for completing and submitting their own course work and preparing their own modules. All work submitted in the course modules must be the student's own work unless outside work is appropriate to the assignment; all outside material must be properly acknowledged. It is also unacceptable to copy directly from your textbook or to use published answer keys or the teacher's edition of a textbook. It is your responsibility to refrain from plagiarizing the academic property of another and to utilize appropriate citation method for all coursework. Ignorance of the citation method is not an excuse for academic misconduct. Remember, there is a difference between paraphrasing and quoting and how to properly cite each respectively.

One tool available to assist you in correct citations is the “References” function in Microsoft Word. This program automatically formats the information you input according to the citation method you select for the document. This program also has the ability to generate a reference or works cited page for your document. The version of Microsoft Word with the “References” function is available in most University computer labs. A demonstration of how to use this tool is available online at the **LSU Student Advocacy & Accountability page**.

Unauthorized Assistance

Unauthorized collaboration constitutes plagiarism. Collaborative efforts that extend beyond the limits approved by the instructor are violations of the academic integrity policy. Students who study together are expected to prepare and write their own individual work for submission and grading.

Examinations

LSU has very strict regulations regarding the administration of exams that must be carefully followed by proctors and students. Examinations must represent the enrolled student’s own work and must be completed under the supervision of the proctor without the assistance of books, notes, devices, or other help, unless specified otherwise in the exam directions or as part of accommodations approved by Disability Services.

The student must pay for any cost involved in having an exam supervised.

If ODL has any question or concern about the administration of an exam, LSU reserves the right, at its sole discretion, to require a student to retake an examination. If asked to retake an exam, you will be notified within thirty days of the original examination. Grades will be awarded on the basis of the second exam only.

Refrain from Using A.I. or "Help" Websites

Use of A.I. or websites that readily give the answers to homework, quiz, and test problems is prohibited. Using A.I. or websites that give answers to problems is similar to having someone else go to the gym and workout on your behalf. You do not benefit from someone else “working out for you.” You have to do it yourself to reap the benefits. Learning mathematics is similar. You have to work the problems. And like

working out at the gym, sometimes working math problems can be painful and frustrating. But you have to persevere. Expect to struggle with some problems. Keep a notebook where you can write out the solutions to your homework problems. Work on understanding the steps required to solve the problems.

Disability Accommodations

A learner with a disability is entitled by law to equal access to university programs. Two federal laws protect persons with disabilities in post-secondary education: the Rehabilitation Act of 1973 (Pub. L. No. 93-112, as amended), the 1990 Americans with Disabilities Act (Pub. L. No. 101-336) and the ADA Amendments Act (Pub. L. No.110-325). LSU A&M is committed to ensuring that its websites, online courses, and all online materials are accessible to people with disabilities.

Online Distance Learning (ODL) will make appropriate, reasonable accommodations for students with disabilities. Specific accommodations must be determined by LSU Disability Services or by the equivalent office at the student's own institution. Accommodations may be permitted for lesson assignments as well as for exams.

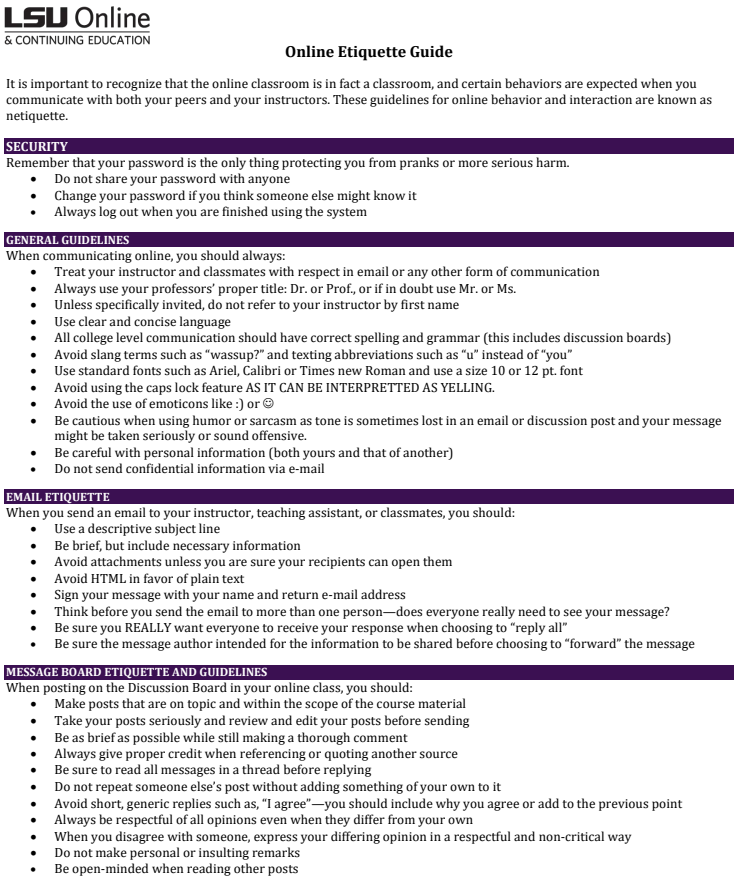
- If you are an LSU Student with a disability and need assistance to obtain or arrange reasonable accommodations, contact LSU Disability Services each time you enroll.
- If you are not an LSU student and have approved accommodations with your home institution, ODL will need official verification of those accommodations.
- If you are not an LSU student and not enrolled in another institution, you should contact LSU Disability Services for assistance.

If you have accessibility needs that we can help with, visit the **LSU Disability Services page** and register for accommodations before you begin your course work.

Netiquette

Communication in the online classroom comes across differently than the communication we are accustomed to through academic writing and face-to-face classroom discussion. Use online etiquette guidelines like the ones listed in the document below to craft your communication.

You can also read **The Core Rules of Netiquette** by Virginia Shea (1994) to understand the human aspect of online communication.



LSU Online & CONTINUING EDUCATION

Online Etiquette Guide

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

SECURITY

Remember that your password is the only thing protecting you from pranks or more serious harm.

- Do not share your password with anyone
- Change your password if you think someone else might know it
- Always log out when you are finished using the system

GENERAL GUIDELINES

When communicating online, you should always:

- Treat your instructor and classmates with respect in email or any other form of communication
- Always use your professors' proper title: Dr. or Prof., or if in doubt use Mr. or Ms.
- Unless specifically invited, do not refer to your instructor by first name
- Use clear and concise language
- All college level communication should have correct spelling and grammar (this includes discussion boards)
- Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you"
- Use standard fonts such as Ariel, Calibri or Times new Roman and use a size 10 or 12 pt. font
- Avoid using the caps lock feature AS IT CAN BE INTERPRETTED AS YELLING.
- Avoid the use of emoticons like :) or ☺
- Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post and your message might be taken seriously or sound offensive.
- Be careful with personal information (both yours and that of another)
- Do not send confidential information via e-mail

EMAIL ETIQUETTE

When you send an email to your instructor, teaching assistant, or classmates, you should:

- Use a descriptive subject line
- Be brief, but include necessary information
- Avoid attachments unless you are sure your recipients can open them
- Avoid HTML in favor of plain text
- Sign your message with your name and return e-mail address
- Think before you send the email to more than one person—does everyone really need to see your message?
- Be sure you REALLY want everyone to receive your response when choosing to "reply all"
- Be sure the message author intended for the information to be shared before choosing to "forward" the message

MESSAGE BOARD ETIQUETTE AND GUIDELINES

When posting on the Discussion Board in your online class, you should:

- Make posts that are on topic and within the scope of the course material
- Take your posts seriously and review and edit your posts before sending
- Be as brief as possible while still making a thorough comment
- Always give proper credit when referencing or quoting another source
- Be sure to read all messages in a thread before replying
- Do not repeat someone else's post without adding something of your own to it
- Avoid short, generic replies such as, "I agree"—you should include why you agree or add to the previous point
- Always be respectful of all opinions even when they differ from your own
- When you disagree with someone, express your differing opinion in a respectful and non-critical way
- Do not make personal or insulting remarks
- Be open-minded when reading other posts

You can click here to download the PDF file.

Extensions

An extension of enrollment is available. The extension extends the enrollment period two months for a fee of $75. Only one extension is available per course enrollment. Requests for an extension must be received in our office prior to the expiration date to avoid being dropped from the course and receiving a "W" in the course.

Guild students: if you need to extend your courses, login to the registration site, go to My Courses, then to My Programs, and under upcoming Courses, add to cart the certificate extension. All other students, use the link below.

Request an extension.

Transcript Information

After you have completed this course, your grade will be filed with the Office of the University Registrar. If a transcript is needed, it is your responsibility to make a request to the registrar. If you would like to order a transcript, visit the **Office of the University Registrar Transcript Requests** page to view your options.

To close this book and return to the Welcome! module, click on the course title at the top of page.