



SYLLABUS

PRAIRIE VIEW A&M UNIVERSITY

Department of Mathematics

Summer 2019

MATH 2043 - P01 Differential Equations CRN: 32462

Department of Mathematics

College of Arts and Sciences

Instructor Name: Dr. Dimitar Michev
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Office Hours: N.A.
Virtual Office Hours: Will respond e-mails

Course Location: W.R. Banks, Room 309
Class Meeting Days & Times: MTWR 01:00 pm – 03:20 pm
Course Abbreviation and Number: MATH 2043
Catalog Description: **MATH 2043. Differential Equations I.** (3-0) Credit 3 semester hours. Ordinary differential equations with emphasis on first-order linear and higher order ordinary differential equations with constant coefficients and some non constant coefficients. Applications.

Prerequisites: MATH 2024
** (MATH 2320)

Co-requisites: NA

Required Text: **Difference and Differential Equations with Applications in Queueing Theory**, by A.M. Haghighi and D.P. Mishev, *John Wiley & Sons, Inc., NJ*, 2013, ISBN: 978-1-118-39324-6
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118393244.html>

Recommended Text: NA

Access to Learning Resources: PVAMU Library:
phone: (936) 261-1500
web: <http://www.tamu.edu/pvamu/library/>
University Bookstore:
phone: (936) 261-1990
web: <https://www.bkstr.com/Home/10001-10734-1?demoKey=d>

Course Goals or Overview:

COURSE GOALS:

At the end of this course, student, successfully completing it, will be ready for course with this course as pre-requisite.

	Upon successful completion of this course, students will be able to:	Program Learning Outcome # Alignment	Core Curriculum Outcome Alignment
1	Identify and distinguish ordinary and partial differential equations.	#1, #3	#1
2	Use computer technology to solve differential equations and systems numerically, and visualize and interpret their results.	#1, #3	#1, #3
3	Realize that a real-world application problem could only be described well by differential equations which may involve lots of variables.	#1, #3, #4	#1, #2
4	Find general and particular solutions of first and second-order linear differential equations, and solve linear systems of differential equations.	#1, #3	#1, #3
5	Show how to <i>translate</i> real-world problems, or problems from the field of work, into the language of differential equations, <i>solve</i> the resulting differential equations subject to given conditions, and <i>interpret</i> the solutions obtained.	#2, #4	#1, #3
6	Apply Generating Functions Method to solve Difference and Differential-Difference Equations.	#1, #3, #4	#1, #3

Program Learning Outcomes:

1. Demonstrate mathematical computational skills in differential equations and apply mathematics.
2. Demonstrate the ability to write mathematically rigorous proofs.
3. Demonstrate the ability to perform advanced mathematical computations and distinguish uses of concepts in Applied Mathematics.
4. Demonstrate a breadth and depth of knowledge in applied mathematics.

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Course Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Exams – written tests designed to measure knowledge of presented course material

Exercises – written assignments designed to supplement and reinforce course material

Projects – web development assignments designed to measure ability to apply presented course material. Not Applicable for this course

Class Participation – daily attendance and participation in class discussions

Grading Matrix

Weights for the percentage course mark

Homework	20%
Exam 1	15%
Exam 2 (Mid Term Exam)	15%
Exam 3	15%
Class Attendance	10%
Final Exam (<i>comprehensive</i>)	25%

The grade and the final percentage course mark are related:

90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
0% - 59%	F

Notes:

- i. Use of various technologies **is allowed and encouraged only in class and for homework (HW) assignments**. However, students are strongly encouraged to make sure understand the problem and the solution rather than just copy from different sources. Justification of solutions in non-automated HW assignments is required,
- ii. All tests must be taken in class and at their scheduled times.
- iii. Any sickness' supporting document must be verified by the department of mathematics.
- iv. A Makeup test should be taken in the faculty or in the mathematics' department office.
- v. For tests, including midterm and final exams, students will be given a **one-sheet consisting of complex formulae** that can be used for the tests, in case it would help. Students should **return this sheet along with the test-sheets**.
- vi. Taking your tests, **you are allowed to use a calculator up to the TI 84 level** (Graphing calculator).
- vii. **Any cellular phone and/or any other device that has access to the Internet and/or is capable of taking picture is not allowed on tests.**

MATH 2043-P01 – DIFFERENTIAL EQUATIONS, Summer 2019

COURSE OUTLINE (subject to change by Instructor of the course's announcement):

Week	Topics
1	Review: Method of Integrations. 3.1. Basic Concepts and Definitions
1	3.2. Existence and Uniqueness 3.3. Separable Equations. Method of Solving Separable Differential Equations. Logistic Equation.
1	3.4. Linear Differential Equations. Method of Solving a Linear First-Order Differential Equation 3.5. Exact Differential Equations
2	Exam 1
2	3.5. Exact/Non-Exact Differential Equations. Integrating Factors. 3.6. Solution of the First ODE by Substitution Method and Reduction to Separation of Variables. Homogeneous Differential Equations.
2	3.6. Solution of the First ODE by Substitution Method and Reduction to Linear Equation. Bernoulli Differential Equations. 3.6. Solution of the First ODE by Substitution Method and Reduction to Separation of Variables. Linear Substitution.
2	3.7. Applications of the First-Order ODEs. Growth and Decay. 3.7. Applications of the First-Order ODEs. Newton's Law of Cooling.
3	Exam 2
3	3.8. Second-Order Homogeneous ODE. 3.8.1. Solving a Linear Homogeneous Second-Order Differential Equation with constant coefficients. Linearity Condition. Real Roots of the Characteristic Equation.

	<p>3.8.1. Solving a Linear Homogeneous Second-Order Differential Equation with constant coefficients: Complex Roots of the Characteristic Equation.</p> <p>3.9. The Second-Order Nonhomogeneous Linear ODE with Constant Coefficients. The Principle of Superposition.</p>
3	<p>3.9.1. Method of Undetermined Coefficients: Type I.</p> <p>3.9.1. Method of Undetermined Coefficients: Type II.</p>
3	<p>3.9.2 Variation of Parameters Method.</p> <p>3.10. Miscellaneous Methods for Solving ODE:</p> <p>3.10.1. Cauchy-Euler Equation.</p>
4	Exam 3
4	<p>2.2 Laplace Transform. The First Shifting Theorem.</p> <p>2.10.3. Application of Laplace Transform to Solve ODE.</p>
4	<p>2.10.3. Application of Laplace Transform to Solve ODE.</p> <p>3.11. Applications of the second-order ODE.</p>
5	Final Exam

Course Procedures or Additional Instructor Policies

Taskstream

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. At least one of your assignments is **REQUIRED** to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. More information will be provided during the semester, but for general information, you can visit Taskstream via the link in eCourses.

Submission of Assignments:

Current homework assignments and computer lab projects will be collected. No late homework or project will be accepted.

Study Hints:

1. Attend class regularly.
2. You should read the material from the textbook before coming to class. The accompanying

assignment sheet shows the class schedule and the corresponding text material for each class meeting. If you miss a class, you are expected to find out which material was covered and to familiarize yourself with it. Please ask questions if you have any.

3. *Form study groups with classmates.*
4. *Make use of office hours.*
5. *Make use of the Math Tutorial Lab in WR Banks, Room 303.*
6. *Study regularly instead of cramming for test.*

Student Support and Success

John B. Coleman Library

The library and its partners have as their mission to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service and to support the University's core values of access and quality, diversity, leadership, relevance, and social responsibility through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. <https://www.pvamu.edu/library/> Phone: 936-261-1500

The Learning Curve (Center for Academic Support)

The Learning Curve offers Tutoring via peer tutoring. The services include workshops (i.e., Save My Semester, Recalculate Your Route), seminars (i.e., Tools You Can Use: TI-84), group review sessions (i.e., College Algebra Topic Reviews, GRE Preparation), group study opportunities (i.e., TSIA, HESI, Study Break, Exam Cram), and test-taking strategies (How to take Notes, Study Buddy, 5 Day Study Guide). The Learning Curve is a nationally certified tutoring program through the National Tutoring Association. The peer tutors are trained and certified by the coordinator each semester. Location: J.B. Coleman Library Rm. 207F. Phone: 936-261-1561

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS)

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS) is designed to help Prairie View students in their second year and beyond navigate towards graduation by providing the following services: Academic Advisement, Targeted Tutorials for Personalized Learning, Campus-Wide Referrals, and Academic & Social Workshops. Location: J.B. Coleman Library Rm. 306. Phone: 936-261-1040

Writing Center

The Writing Center provides student consultants on all aspects of the writing process and a variety of writing assignments. Writing Center consultations assist students in such areas as prewriting, brainstorming, audience awareness, organization, research, and citation. Students taking on-line courses or courses at the Northwest Houston Center or College of Nursing may consult remotely or by email. Location: Hilliard Hall Rm. 121. Phone: 936-261-3724.

Student Counseling Services

The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas and provides assistance to students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially and in accordance with Texas State Law. Location: Owens-Franklin Health Center Rm. 226. Phone: 936-261-3564

Testing

The Department of Testing administers College Board CLEP examinations, the HESI A2 for pre-nursing majors, LSAT for law school applicants and MPRE for second-year law students, the Experiential Learning Portfolio option, the Texas Success Initiative (TSI) Assessment, which determines college readiness in the state, and exam proctoring, among other service such as SAT and ACT for high school students. Location: Delco Rm. 141. Phone: 936-261-4286

Office of Diagnostic Testing and Disability Services

As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include: learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hard and software, adapted furniture, proctoring of non-standardized test administrations, ASL interpreters, ALDs, digital recorders, livescribe, Kurtzweil, and a comprehensive referral network across campus and the broader community. Location: Evans Hall Rm. 317. Phone: 936-261-3585

Veteran Affairs

Veterans Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall Rm. 323. Phone: 936-261-3563

Office for Student Engagement

The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development and campus governance. Location: Memorial Student Center Rm. 221. Phone: 936-261-1340

Career Services

Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Evans Hall Rm. 217. Phone: 936-261-3570

University Rules and Procedures

Disability Statement (Also See Student Handbook):

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Evans Hall, Room 317, or call 936-261-3585/3.

Academic Misconduct (See Student Handbook):

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of Academic Dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic Misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual Misconduct (See Student Handbook):

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Title IX Statement

Prairie View A&M University (PVAMU) is committed to supporting students and complying with the Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of sex- or gender-based discrimination, including sexual harassment, sexual assault or attempted sexual assault, we encourage you to report it. While you may talk to a faculty member about an incident of misconduct, the faculty member must report the basic facts of your experience to Ms. Alexia Taylor, PVAMU's Title IX Coordinator. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Title IX Coordinator is designated to handle inquiries regarding non-discrimination policies and can assist you with understanding your options and connect you with on- and off-campus resources. The Title IX Coordinator can be reached by phone at 936-261-2123 or in Suite 013 in the A.I. Thomas Administration Building.

Class Attendance Policy (See Catalog for Full Attendance Policy)

Prairie View A&M University requires regular class attendance. Attending all classes supports full academic development of each learner whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or internet.

Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

TECHNICAL CONSIDERATIONS**Minimum Recommended Hardware and Software:**

- Intel PC or Laptop with Windows 7; Mac with OS X; Smartphone or iPad/Tablet with Wi-Fi
- High speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, Internet Explorer or Firefox

Note: Be sure to enable Java & pop-ups in the Web browser preferences

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving email
- A working knowledge of the Internet

- Proficiency in Microsoft Word (or a program convertible to Word)
- Proficiency in the Acrobat PDF Reader
- Basic knowledge of Windows or Mac O.S.

Netiquette (online etiquette):

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussions boards. Foul or abusive language will not be tolerated.

Technical Support:

Students should go to <https://mypassword.pvamu.edu/> if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Office of Distance Learning at 936-261-3283

Communication Expectations and Standards:

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement:

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplished by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it/they should be copied and pasted to the discussion board.

College of Arts and Sciences Student & Staff Aspiration Statement

The faculty and staff of the College of Arts and Sciences at PVAMU are committed to providing the best possible quality education to its students. To that end, we will work hard to prepare the students for success by setting the proper academic environment and background necessary to facilitate learning. In order for us to be successful, there are some basic expectations our students must demonstrate. These expectations are a simple ingredient to foster camaraderie and '*esprit de corps*' in every class and classroom on campus. Additionally, these are lifelong fundamental learning skills to better prepare students for success in America's job market.

CAS student expectations:

- You are expected to come to class prepared and on time.
- Higher education is an investment in your future, to that end; you must endeavor to be properly equipped for class. (i.e. School supplies, text, and other supporting materials).
- Resolution of any classroom issues (i.e. Grades, course materials, etc) should begin with the instructor.
- If you must leave early, notify the instructor before the class begins, sit by the door, and exit quietly
- Be considerate of your fellow classmates; please turn off all phones, pagers and other electronic devices.
- Do not talk to other students during lecture. If you have a question or a comment on the subject being discussed, address it to the instructor directly.
- Walk quietly through the hallways, classes in other rooms may still be in session.

- Please refrain from eating, drinking, sleeping in class, using profanity, and engaging in any form of horseplay in the classroom it is disruptive to your fellow classmates.
- Be respectful, civil, polite and considerate when dealing with your professors as well as your fellow classmates.
- Student attire is based on personal preference and taste. The rule of thumb is simple, if it projects a statement which is offensive to others, then maturity should dictate that it is probably not a good idea to wear to class.
- Enthusiasm is infectious, a smile and positive attitude will go far to motivate and charge your professors and fellow classmates