

McLennan C O M M U N I T Y C O L L E G E

WACO, TEXAS

COURSE SYLLABUS AND INSTRUCTOR PLAN

Differential Equations

MATH 2320.15

Peter Blaskiewicz

NOTE: This is a 16-week course.

COVID 19 Notice:

McLennan Community College is committed to providing you with every resource you need to reach your academic goals including your safety. We will continue to monitor the evolving situation with COVID 19 and adjust our safety guidelines to make sure we offer a safe environment for you and our faculty. Please make sure to consult your faculty and the MCC website at <https://www.mclennan.edu/crisis-management/coronavirus-updates/index.html> on any changes to these guidelines.

Differential Equations

Math 2320.15

Course Description:

Topics include methods of solving ordinary differential equations of the first order, theorems on existence and uniqueness of solutions, and solving linear differential equations of higher order, including systems of equations, equations with variable coefficients, solutions in series and singular points, solutions using Laplace transforms, boundary value problems, and applications of these concepts in solving real-world problems.

Prerequisites and/or Corequisites:

MATH 2414 (Calculus II) with a minimum grade of C, as a prerequisite.

Course Notes and Instructor Recommendations:

MyMathLab (*MML*) will be used extensively for posting course notes, assignments, grades, testing, and other communications. Students are expected to check their *MML*, Brightspace, and MCC email accounts often.

One long-range objective for this course is to help those who are engineering majors get ready for certification after the bachelor's degree. Since that test does not allow a graphing or CAS calculator, this course won't be allowing one on our tests, either. It's important to be weaned from crutches like this or from heavy dependence on notes during tests, going into your upper-level courses.

Please do not, under any circumstances, come to class if you are even slightly sick or have any symptoms that make you think you might possibly be sick, no matter what type of illness. Let me know, and I will make arrangements for you to be able to get the material that is being covered on the day that you are out due to illness.

I will be available for individual Zoom chat sessions / 'office hour' by arrangement, especially if you cannot come to one of the regular class sessions. I request that you first watch any available video over the missed class, so that we are not reinventing the wheel. The best way to arrange a Zoom meeting is by emailing me with a suggestion of a time or two that would work for you; if you call me, a voice message would go to my email box anyway.

Instructor Information:

Instructor Name:	Peter Blaskiewicz
MCC E-mail:	pblaskiewicz@mclennan.edu
Office Phone Number:	(254) 299-8869
Office Location:	MATH 213
Office/Teacher Conference Hours:	MW 9:45 – 10:45 a.m.; TTh 1:30 – 2:30 p.m.; other times by arrangement

Required Text & Materials: (two things: MyMathLab, and a pdf file)

MyMathLab -- Title: Fundamentals of Differential Equations (9th Ed) by Nagle, Saff, and Snider [Pearson]. The CourseID will be given in Brightspace.

Note: 18-Week access to MyMathLab is sufficient duration.

Pdf file -- Elementary Differential Equations with Boundary Value Problems, by William Trench [self-published]. Free download at <https://digitalcommons.trinity.edu/mono/9/>

Optional pdf file – Student Solution Manual for the Trench pdf text. Free download at http://scholarcommons.usf.edu/oa_textbooks/7/

No graphing calculator is needed (nor allowed on tests).

MCC Bookstore Website: <http://www.mclennan.edu/bookstore/>

Methods of Teaching and Learning:

Lecture (face-to-face classroom meetings), with student participation in example problems; lecture preparation available through e-text and publisher videos posted in MyMathLab; homework submitted online through MyMathLab; tests and a final exam in MyMathLab with proctoring, or else with pencil and paper.

Course Objectives and/or Competencies:

Upon successful completion of this course, students will: (chapters refer to Trench pdf)

1. Identify homogeneous equations, homogeneous equations with constant coefficients, and exact and linear differential equations. (Chapters 2 and 5)
2. Solve ordinary differential equations and systems of equations using:
 - a) Direct integration (Chapter 2)
 - b) Separation of variables (Chapter 2)
 - c) Reduction of order (Chapter 5)
 - d) Methods of undetermined coefficients and variation of parameters (Chapter 5)
 - e) Series solutions (Chapter 7)
 - f) Operator methods for finding particular solutions (Chapter 5)
 - g) Laplace transform methods (Chapter 8)
3. Determine particular solutions to differential equations with given boundary conditions or initial conditions. (All chapters)
4. Analyze real--world problems in fields such as Biology, Chemistry, Economics, Engineering, and Physics, including problems related to population dynamics, mixtures, growth and decay, heating and cooling, electronic circuits, and Newtonian mechanics. (Chapters 4 and 6)

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Course Outline or Schedule:

The schedule is subject to change. Should a change become necessary, students will be notified about changes verbally, during class. In the event unforeseen circumstances prevent a class from occurring as scheduled, either make-up lecture material will be posted in Brightspace or the calendar schedule will be adjusted and announced. If something on the school's end prevents a test from taking place as scheduled, the test window will be moved forward to the next available day.

Week	Section (Trench)	Topic
1	1.1-3; 2.1	Applications leading to DEs; First-order Eqs, include FOLDEs
2	2.2-2.4	Separable Equations; Transforming non-linear DEs into separable
3	2.5-2.6	Exact eqs; Integrating factors
4	4.1-4.3	Applications of FOLDEs: Growth/decay; cooling, mixing, mechanics
5	5.1	TEST 1 – Chapters 1 – 2, 4; Intro to higher order DEs
6	5.2-5.3	Homogeneous eqs; Constant coefficient DEs
7	5.4-5.7	Undetermined coefficients; Variation of parameters
8	6.1-6.3	Modeling: Springs, circuits
9	7.1	TEST 2 – Chapters 5 – 6; Review of power series
10	7.2 -7.4	Series solutions: ordinary points and singular points
11	8.1-8.2	Laplace Transforms: definition, inverse, transforms of derivatives
12	8.3-8.4	Laplace Transforms: operational properties
13	8.5-8.8	Laplace Transforms: Forcing functions, Dirac Delta fcn
14	9.1-9.2	TEST 3 – Chapters 7 – 8; Higher-order linear DEs
15	10.1-10.4	Systems of Linear DEs
16		Final Exam -- cumulative

Course Grading Information:

Your course grade will be based on homework, classwork, chapter tests, and a cumulative exam. The relative weights of each of these factors is as follows:

Homework (MML), Class board work and group problems	30%
Tests and quizzes	50%
Final Exam	20%

Homework must be completed using MyMathLab. If you choose to use a calculator on your homework, remember that you will not be able to use it during tests. While you may choose to use it on steps that you have mastered, it's important not to use it as a crutch. You have infinite attempts on each problem, so there's no reason not to have 100% on the homework.

You can complete HW 0 right away, but you cannot access HW 1 & 2 or anything beyond until you complete the Technology Check. This will ensure your system is compatible with the Respondus Monitor software. You'll need a webcam. If you cannot get this working, contact me

immediately so we can figure out alternatives. The Technology Check does not count in the gradebook.

Two regular tests and a final exam will be given during the semester. The only things you will need on the exam is a pencil, scratch paper, and a 3x5 notecard on which you can write anything that makes you happy (front and back). **You may not use a calculator.** Your lowest grade in this category can be replaced with your final exam grade, if your final exam grade is higher. The final exam grade cannot be dropped or retaken.

All tests will be taken using the MyMathLab software using Respondus Lockdown Monitor, unless other arrangements are made (including ADA accommodations, etc).

There is a practice test for each test. You must earn a 60% or higher on the associated practice test in order for the actual test to be available. You may attempt the practice test as many times as you like, and only your highest attempt will count. The practice test is only representative of the actual test – the problems themselves will likely be different. ***Again: you cannot take the actual test until you've earned a 60% or higher on the practice test.***

The final exam will be cumulative. It is scheduled for Wednesday, May 4, from 3:25 to 5:25 p.m. Your percentage grade on the final may also count in place of your one lowest test grade, if that is to your advantage.

The letter grade received in this course will be based on the customary 90-80-70-60 scale.

Late Work, Attendance, and Make Up Work Policies:

Homework over a unit (group of chapters) is due the day of the test over those chapters. Homework problems worked after the time they are due are penalized at 2% per day. If they are late, do them anyway, because some credit is better than none, and you need to learn the material anyway. But since homework prepares you for tests, please do it before the deadline.

If you have to miss one test for one of the reasons given in MCC's General Catalog, and you have provided a documented excuse for doing so, the exam will also count as your make-up test for that unit. If it is necessary for you to miss more than one test, you should discuss the situation with me. Unexcused absences from tests will not be made up.

If you are absent from 25% of the scheduled class meetings by the deadline for student-initiated drops, you will be dropped from the class. If this limit is reached after that date, you will be kept on the roll, and the grade that you earn for the semester is the grade you will receive.

Student Behavioral Expectations or Conduct Policy:

Students are expected to maintain classroom decorum that includes respect for other students and the instructor. Students should demonstrate an attitude that seeks to take full advantage of the education opportunity. For more details of College Conduct Policy, see the [Highlander Student Guide](#)

Students are expected to be courteous and respectful of their classmates and of instructors at all times. This includes, but is not limited to, the following.

For face-to-face meetings:

- Masking and social distancing will be ***highly*** encouraged in our classroom. Not taking other people around you into consideration and respecting their expectations of a safe environment will be grounds for you being required to leave. It would be best if you would continue to follow the masking and social distancing guidelines that have been in place for the past several months.
- If you are ill or have any symptoms of ***any*** illness (not limited to Covid), do not come to school.
- Arrive in the classroom on time; be as unobtrusive as possible if tardy.
- Silence or turn off cell phones and other communication devices during all regular class periods. (During tests, these devices should not be present at all. If you access your phone during a test, you are automatically finished with your test and must turn it in immediately.)
- Save private conversations with other students for before/after class lectures.
- Do not bring children to class nor leave them unattended on campus. To do so is contrary to school policy.
- Do not use excessive amounts of fragrance. Doing so is grounds for being required to leave.
- You may not share calculators on a test.

For Zoom meetings, if we have any:

- Familiarize yourself with Zoom's features
 - Please do participate in the class meetings. It's fine to have your mic on and ready for interaction, but mute yourself if the dog or children or other background noise would disrupt us.
 - Please use your webcam if you have one. Let me, as well as your fellow classmates, know who is in this course with us. But be mindful of your surroundings when your webcam is on. If necessary or desirable, use a non-distracting virtual background; Zoom provides that option.
 - Dress appropriately for class.
 - Once the lecture gets going, stick to the topic at hand, just as you would for a face-to-face lecture class. Avoid doing other tasks, checking email, being on the phone, or the like.
 - Do not use coarse or foul or offensive language, nor offensive or questionable imagery. Violation of this would be grounds for disciplinary action, including (but not limited to) being dropped from the course.
- Remember that the session is being recorded.

*** [Click Here for the MCC Academic Integrity Statement](#)**

(www.mclennan.edu/academic-integrity)

The link above will provide you with information about academic integrity, dishonesty, and cheating.

Collaboration on out-of-class homework or projects is encouraged, but at no time should work belonging to one student be in the possession of another student. Likewise, students are not to engage in cheating in any form during or in preparation for tests or the final exam. All students involved in a cheating incident, whether in providing or receiving assistance, will receive grades of 0 for that assignment, be reported to Student Development, and find their names placed in the MCC database for cheating incidents. If there is a second incident, all students involved will be given grades of F for the course and listed as repeat offenders in the database.

*** [Click Here for the MCC Attendance/Absences Policy](#)**

(<https://www.mclennan.edu/highlander-guide/policies.html>)

Click on the link above for the college policies on attendance and absences.

Regular and punctual attendance is expected of all students, and each instructor will maintain a complete record of attendance for the entire length of each course, including online and hybrid courses. Students will be counted absent from class meetings missed, beginning with the first official day of classes. Students, whether present or absent, are responsible for all material presented or assigned for a course and will be held accountable for such materials in the determination of course grades.

Note: A student who is in quarantine is encouraged, if possible, to use the Zoom meeting ID given in Brightspace to ‘attend’ class. The audio and the document camera will be accessible that way, and you can use the chat box (and possibly your microphone) to participate. If you are in quarantine and you attend class via Zoom, the absence will not count against you. Under no circumstances are you to come to class or to campus if you are under quarantine.

McLennan

C O M M U N I T Y

COLLEGE

ACADEMIC RESOURCES/POLICIES

Accommodations/ADA Statement:

Any student who is a qualified individual with a disability may request reasonable accommodations to assist with providing equal access to educational opportunities. Students should contact the Accommodations Coordinator as soon as possible to provide documentation and make necessary arrangements. Once that process is completed, appropriate verification will be provided to the student and instructor. Please note that instructors are not required to provide classroom accommodations to students until appropriate verification has been provided by the Accommodations Coordinator. For additional information, please visit www.mclennan.edu/disability.

Students with questions or who require assistance with disabilities involving physical, classroom, or testing accommodations should contact:

disabilities@mclennan.edu

254-299-8122

Room 319, Student Services Center

Title IX:

We care about your safety, and value an environment where students and instructors can successfully teach and learn together. If you or someone you know experiences unwelcomed behavior, we are here to help. Individuals who would like to report an incident of sexual misconduct are encouraged to immediately contact the Title IX Coordinator at titleix@mclennan.edu or by calling Dr. Drew Canham (Chief of Staff for Diversity, Equity & Inclusion/Title IX) at (254) 299-8645. Individuals also may contact the MCC Police Department at 299-8911 or the MCC Student Counseling Center at MCC at (254) 299-8210. The MCC Student Counseling Center is a confidential resource for students. Any student or employee may report sexual harassment anonymously by visiting <http://www.lighthouse-services.com/mclennan/>.

Go to McLennan's Title IX webpage at www.mclennan.edu/titleix/. It contains more information about definitions, reporting, confidentiality, resources, and what to do if you or someone you know is a victim of sexual misconduct, gender-based violence or the crimes of rape, acquaintance rape, sexual assault, sexual harassment, stalking, dating violence, or domestic violence.

Student Support/Resources:

MCC provides a variety of services to support student success in the classroom and in your academic pursuits to include counseling, tutors, technology help desk, advising, financial aid, etc. A listing of these and the many other services available to our students is available at <http://www.mclennan.edu/campus-resource-guide/>

College personnel recognize that food, housing, and transportation are essential for student success. If you are having trouble securing these resources or want to explore strategies for balancing life and school, we encourage you to contact a Success Coach by calling (254) 299-8226 or emailing SuccessCoach@mclennan.edu. Students may visit the Completion Center Monday-Friday from 8 a.m.-5 p.m. to schedule a meeting with a Success Coach and receive additional resources and support to help reach academic and personal goals. Paulanne's Pantry (MCC's food pantry) provides free food by appointment to students, faculty and staff based on household size. Text (254) 870-7573 to schedule a pantry appointment. The Completion Center and pantry are located on the Second Floor of the Student Services Center (SSC).

MCC Foundation Emergency Grant Fund:

Unanticipated expenses, such as car repairs, medical bills, housing, or job loss can affect us all. Should an unexpected expense arise, the MCC Foundation has an emergency grant fund that may be able to assist you. Please go to <https://www.mclennan.edu/foundation/scholarships-and-resources/emergencygrant.html> to find out more about the emergency grant. The application can be found at https://www.mclennan.edu/foundation/docs/Emergency_Grant_Application.pdf.

MCC Academic Integrity Statement:

Go to www.mclennan.edu/academic-integrity for information about academic integrity, dishonesty, and cheating.

Minimum System Requirements to Utilize MCC's D2L|Brightspace:

Go to <https://www.mclennan.edu/center-for-teaching-and-learning/Faculty-and-Staff-Commons/requirements.html> for information on the minimum system requirements needed to reliably access your courses in MCC's D2L|Brightspace learning management system.

Minimum Technical Skills:

Students should have basic computer skills, knowledge of word processing software, and a basic understanding of how to use search engines and common web browsers.

Backup Plan for Technology:

In the event MCC's technology systems are down, you will be notified via your MCC student email address. Please note that all assignments and activities will be due on the date specified in the Instructor Plan, unless otherwise noted by the instructor.

Email Policy:

McLennan Community College would like to remind you of the policy (<http://www.mclennan.edu/employees/policy-manual/docs/E-XXXI-B.pdf>) regarding college email. All students, faculty, and staff are encouraged to use their McLennan email addresses when conducting college business.

A student's McLennan email address is the preferred email address that college employees should use for official college information or business. Students are expected to read and, if needed, respond in a timely manner to college emails.

Instructional Uses of Email:

Faculty members can determine classroom use of email or electronic communications. Faculty should expect and encourage students to check the college email on a regular basis. Faculty should inform students in the course syllabus if another communication method is to be used and of any special or unusual expectations for electronic communications.

If a faculty member prefers not to communicate by email with their students, it should be reflected in the course syllabus and information should be provided for the preferred form of communication.

Email on Mobile Devices:

The College recommends that you set up your mobile device to receive McLennan emails. If you need assistance with set-up, you may email Helpdesk@mclennan.edu for help.

Forwarding Emails:

You may forward emails that come to your McLennan address to alternate email addresses; however, the College will not be held responsible for emails forwarded to an alternate address that may be lost or placed in junk or spam filters.

Disclaimer:

The resources and policies listed above are merely for informational purposes and are subject to change without notice or obligation. The College reserves the right to change policies and other requirements in compliance with State and Federal laws. The provisions of this document do not constitute a contract.