

**Nashville State Community College
School of STEM
Mathematics Program**

**Master Course Syllabus
Full 15-Week Term
MATH 2120 – Differential Equations**

The purpose of the syllabus is to inform you how this course is organized, what the expectations are, and how you will be graded. In addition, there is important information about how the college will operate during severe weather and how the college will communicate with you. The syllabus is not a contract. Instead, it is meant to help you succeed in this course. If any of the content changes during the course term, you will be notified.

Course information:

Course Title: MATH 2120 – Differential Equations

Credits: 3

Class Hours: 3

Course Description:

This is an introductory course in ordinary differential equations. Topics include linear first-order differential equations, applications, homogeneous linear differential equations, second-order linear equations, systems of differential equations, and the Laplace Transform.

Instructor Information:

Name:

Email:

Office Phone:

Office Location:

Instructor Zoom Room link:

Class Session Zoom Link Information:

Course Delivery Method

- **Virtual:**

Required Textbook(s) & Other Materials:

Textbook(s): *Elementary Differential Equations* by William F. Trench, available for free at http://ramanujan.math.trinity.edu/wtrench/texts/TRENCH_DIFF_EQNS_I.PDF

Reference Materials: *Student Solutions Manual for Elementary Differential Equations and Elementary Differential Equations with Boundary Value Problems*, by William F. Trench, available for free at http://ramanujan.math.trinity.edu/wtrench/texts/TRENCH_DE_STUDENT_MANUAL.PDF

Supplies: Students are expected at this point to have a TI-8x (or equivalent) calculator. A calculator is not strictly required in this course, but one does sometimes prove useful. Apps that provide step-by-step solutions are **not** allowed

Once you have registered for your courses, you should make sure you have the correct textbook and materials for each course. Before courses begin, you can do this by looking up your courses on the [bookstore's website](https://www.bkstr.com/nscstore/shop/textbooks-and-course-materials) (<https://www.bkstr.com/nscstore/shop/textbooks-and-course-materials>) using your A# or by entering your course information. If you are registered with the Access Center and need an alternate format for the textbook and other course materials, please contact the Access Center at 615-353-3721 or accesscenter@nsc.edu.

Honors Option: Honors credit is available in some classes. If you are interested in participating in the Honors Program, please see your instructor within the first four weeks of class.

Course Outcomes: At the end of the term, this is what you should know and/or be able to do:

- Use first-order and second-order differential equations and their solutions.
- Apply the concepts of differential equations to suitable mathematical model.
- Use graphing calculators and/or computer software as tools for the field of study.
- Apply analysis, synthesis, symbol manipulation, graphical conceptualization and technical writing skills in real-world situations.
- Analyze real-world problems related to population growth, predators and prey, competing species and corporations, biology, chemistry, mechanics, thermodynamics, harmonic oscillation, resonance, electric circuits, and anything else that moves.
- Analyze solution techniques comparatively: graphical, numerical, matrix, symbolic, and transforms.

Course Competencies:

The following are detailed course competencies, or specific skills or knowledge, intended to help you achieve the course outcomes:

- Classify ordinary differential equations by order and linearity
- Use various techniques to find both general and particular solutions to differential equations
- Use Euler's method to approximate a particular solution to an initial value problem
- Understand the existence and uniqueness questions relating to an initial value problem
- Use differential equations to model a variety of physical phenomena
- Compute the Laplace transform of a function

Topics to Be Covered:

- Initial Value Problems
- Mathematical Models

- First Order Differential Equations
- Separable Variables
- Linear Equations
- Solutions by Substitutions
- Euler’s Method
- Linear Models
- Nonlinear Models
- Higher Order Differential Equations
- Reduction of Order
- Homogeneous Equations with Constant Coefficients
- Undetermined Coefficients
- Variation of Parameters
- Cauchy-Euler Equations
- Mass-Spring Systems
- Laplace Transforms

Course Assessments: We will use the following assessments to demonstrate your understanding, knowledge, and skills:

- Two regular tests worth a total of 50% of the grade
- Weekly homework assignments with a total of 20% of the grade.
- One cumulative final exam worth 30% of the grade

Grading Policy:

A student’s final exam grade can replace their lowest test score: that includes a missed test, but it does **not** include a test that was assigned a zero due to academic misconduct. We will have about eight homework assignments through the semester. I will drop your two lowest homework scores. Also see the below policy regarding late homework assignments (one can be up to two days late, but all other late homework assignments will be given a zero).

Grading Scale:

Letter Grade	Percentage Range
A	average $\geq 90\%$
B	$80\% \leq \text{average} < 90\%$
C	$70\% \leq \text{average} < 80\%$
D	$60\% \leq \text{average} < 70\%$
F	average $< 60\%$

FA

If you stop attending class or if you are in an online class and stop submitting assignments, but do not turn in a withdrawal form by the deadline, you are still enrolled in class. You will be given a grade of FA, which means you have failed due to not attending class and not completing your assignments. Please refer to the current academic calendar available on the Nashville State web site, looking for the date

that indicates it is the “Last Day to Earn F for Attendance (FA).” If you stop attending your course after this date, you will receive an F.

FN

An FN is awarded if you have never attended your course or done any of the work in an online course.

Late Work Policy & Make-up Procedures for Missed Assignments and Work:

Students will have a window of time in which to take each test, so there is no excuse for missing a test. Tests will not be administered after the closing date. Each student will be allowed exactly one “late homework pass” that lets them submit one homework assignment up to two days late. I will automatically apply that pass if the need arises. Any additional late homework assignments will be given a zero.

Attendance Policy

- *Absences in a course may affect your final grade.*
- *Tardiness may also affect your final grade.*
- *You are responsible for all work/tests that occur during any missed course session(s) regardless of reason(s) for absence.*
- *If you are not well enough to attend a course session (class), you must notify the instructor as soon as possible before the scheduled course time.*
 - *If you are unable to notify an instructor before the scheduled course time, you must contact the instructor as soon as reasonably possible.*
- *If you have an unavoidable conflict with a scheduled course session, you must notify the instructor before the course session.*
 - *If you are unable to notify an instructor before the scheduled course time, you must contact the instructor as soon as reasonably possible.*

For financial aid purposes, **attendance** is measured by participation in the course. Instructors can determine your level of participation in several ways. Some of those ways are:

- continued attendance
- participation in on-ground or virtual class sessions
- participating in D2L as prompted
- responding to an instructor’s email
- posting to a discussion board
- completing and submitting assignments

Technology Statement

- All classes at the College are web enhanced. “Web enhanced” means that components of the course, such as assignments and online discussions, may be located online in the class D2L/NS Online course shell and used in the course, even if the course meets in a classroom on ground.
- You must have access to a computer and an internet connection to complete assignments, engage in online discussions, and access various course materials through D2L/NS Online course shells.

- You may also be required to use free video conferencing platforms (examples: Zoom, Teams, etc.) for course sessions and meetings.
- You will be responsible for appropriate dress while on video. This means that you are expected to dress as if you were in a classroom.
- You will be responsible for a distraction free environment while on video. This means that the professor and others in the course should not be able to hear noise in your home, such as cell phones, TVs, or barking dogs. The best way to do this is to keep yourself on “mute” until you need to speak.
- You will be responsible for making sure your background is neutral. Keep in mind that students and professors come from all around the world, and you are all a part of our community. Therefore, please avoid having images in your background that may be offensive to your classmates.
- Certain publisher materials, such as textbook figures, may not work on cellphones and may require a laptop or a tablet.
- If you have questions or concerns regarding access to a computer or internet resources, please contact your instructor. Additional information is available on the [access to internet and technology website](#).

Computer Labs

Computers are available for all Nashville State students to use at each campus during open hours. Open computer lab availability may vary from campus to campus.

You should check the NSCC website for current hours of operation.

D2L/NS Online and myNSCC

It is your responsibility to check your email in **both** D2L/NS Online course shells and your @my.nsc.edu (student email) on a regular basis. These are the official communication channels between the college and you. You are responsible for the information communicated through these email channels. D2L/NS Online emails contain specific course information and @my.nsc.edu emails contain important information from college offices, such as Financial Aid.

ADA Compliance Statement

If you need accommodations due to a disability, please do not hesitate to reach out to our Access Center. Disabilities for which you can receive accommodations include documented physical, emotional, and/or learning conditions. Nashville State is committed to supporting your success, and we encourage you to get assistance if needed. If you require accommodations for any courses in which you are enrolled, contact the Access Center at 615.353.3741 or 615.353.3721, or e-mail accesscenter@nsc.edu.

Classroom Misconduct

Disruptive conduct is not allowed in the classroom. Disruptive conduct is any behavior that prevents students from learning and interferes with the ability of the instructor to teach. This may change from course to course; therefore, your individual instructors will give you guidance on what qualifies as “disruptive conduct” in their courses. Please review the [Nashville State Student Code of Conduct policy](#). Please be aware that children are not allowed in class or to be left unattended on campus.

Academic Misconduct

You have started this academic journey to prepare for a future career. Because of this, it is important that you learn the materials being presented in your courses. For this reason, cheating, in any form, robs you of your opportunity to learn and master the material that will enable you to succeed in that future career. Nashville State has a clear [Academic Misconduct Policy](#) that you are expected to follow. In addition, your instructors will clarify what Academic Misconduct looks like and the consequences for violations in each course that you take. The instructor has the authority to assign an “F” or a “zero” for such violations or for the term grade.

Students are allowed (and even encouraged) to work together on homework, but each student is to write up and submit their own work. When I see the same careless mistake show up in the same place on several different students’ papers, I know that one person did all the work, and the others just copied that work. That is not allowed. You learn nothing that way. The work should be independent enough that you each get to make your own mistakes.

Tests will be open book and open notes but help from another human being or fancy “math solver” are not allowed.

Academic Early Alert System

If you are not doing well in your course, your instructor may send you an Early Alert through your @my.nsc.edu email. This email will go to your academic advisor and Student Success advisor, as well. If you get an Early Alert, contact your instructor immediately. Instructors send these when they want to help you figure out how to get extra support to pass the course. An Early Alert does not mean that you have already failed the course. Rather, it means you are in danger of failing the course if you do not change your learning strategy. Please use an Early Alert to your advantage and as an opportunity to improve your grade.

RAVE Emergency Alert System

You can log in to this free alert system to receive text messages about emergencies related to NSCC campuses through the [RAVE app \(https://www.getrave.com/login/nsc\)](https://www.getrave.com/login/nsc). The instructions for this are listed below.

- Your RAVE Username is your NSCC email address.
- If you've never received an email from RAVE with your password, or if you need to reset your password, select “Forgot your password?” and a new password will be emailed to you.
- Should the RAVE system indicate “user not found”, select Register and create your own RAVE account.

Student Wellness

Your well-being is important to us. With this in mind, the college has several resources available to provide support when needed:

- [Free tutoring](#) can assist you beyond the classroom to help you make the most of your college education.

- [These resources](#) include NSCC email, scheduling, online courses, textbooks, tech check out and support, computer labs on campuses, academic advising, financial advising, COVID-19 information and procedures on campuses.
- [Services](#) that help with bus passes, food, childcare, textbooks, housing, financial counseling, personal counseling, suicide prevention, health insurance.

Equity Statement

Nashville State Community College strives to ensure that each student receives what that student needs to be successful, with goals of success beyond the classroom. We understand and practice ideals of equity and inclusion for our students by embracing a full spectrum of experiences, viewpoints, and intellectual approaches in order to overcome barriers to success.

Inclement Weather & Campus Closings

You get notices about campus closings in these places: text messages from RAVE and [the Nashville State website](#).

Even when campuses are closed, you are still responsible for completing all assigned work. Check D2L/NS Online for a message from your instructor so you do not miss important assignments and due dates, which may change due to the campus closure.

Class Cancellation Policy

Our instructors post messages about cancelling classes in the [D2L/NS Online](#) course shells and/or on the classroom door on campus. These messages can be found in the News and Content section or the Email tab in the online shell. Please check these to be sure that you take advantage of opportunities for learning and points toward your grade.