Calculus I – MATH 2413.051, Dual Credit - Winnsboro High School

Course Syllabus: Spring 2022

"Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed."

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Office Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Online
	7:30-8:00	7:30-8:00	7:30-8:00	7:30-8:00	7:30-8:00	Available via email
	3:35-3:55	3:35-3:55	3:35-3:55	3:35-3:55		

This syllabus serves as the documentation for all course policies and requirements, assignments, and instructor/student responsibilities.

Information relative to the delivery of the content contained in this syllabus is subject to change. Should that happen, the student will be notified.

Course Description: This is a standard first course in calculus. Topics include limits, continuity; definition of the derivative of a function and techniques of differentiation; applications of the derivative to maximizing or minimizing a function; the chain rule, mean value theorem, and rate of change problems; curve sketching; the Fundamental Theorem of Calculus; definite and indefinite integration of algebraic, trigonometric, and transcendental functions, with an application to calculation of areas. Four hours credit.

Prerequisite(s): MATH 2412 or equivalent with a grade of "C" or better

Student Learning Outcomes:

2413.1   Develop solutions for tangent and area problems using the concepts of limits, derivatives, and integrals.

2413.2   Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point.

2413.3   Determine whether a function is continuous and/or differentiable at a point using limits.

2413.4   Use differentiation rules to differentiate algebraic and transcendental functions.

2413.5   Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems.

2413.6   Evaluate definite integrals using the Fundamental Theorem of Calculus.

2413.7   Articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.

Core Curriculum Purpose and Objectives:
Through the core curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world; develop principles of personal and social responsibility for living in a diverse world; and advance intellectual and practical skills that are essential for all learning.
Courses in the foundation area of mathematics focus on quantitative literacy in logic, patterns, and relationships. In addition, these courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.

Program Student Learning Outcomes:

Critical Thinking Skills

CT.1   Students will demonstrate the ability to 1) analyze complex issues, 2) synthesize information, and 3) evaluate the logic, validity, and relevance of data.

Communication Skills

CS.1   Students will effectively develop, interpret and express ideas through written communication.

Empirical and Quantitative Skills

EQS.1   Students will manipulate numerical data or observable facts by organizing and converting relevant information into mathematical or empirical form

EQS.2   Students will analyze numerical data or observable facts by processing information with correct calculations, explicit notations, and appropriate technology.

EQS.3   Students will draw informed conclusions from numerical data or observable facts that are accurate, complete, and relevant to the investigation.

Evaluation/Grading Policy:

4 Major Exams	50%
Homework / Quiz Grade	20%
4 Maple Assignments	10%
Comprehensive Final Exam	20%
TOTAL	100%

Grading System
"A"	90-100%
"B"	80-89%
"C"	70-79%
"D"	60-69%
"F"	< 60%

Graded assignments will be returned no later than three days following the assignment due date. For due dates, refer to the tentative class schedule below.

Required Instructional Materials:
Larson/Edwards, Calculus, 11th Edition, 2018
Loose-leaf textbook with WebAssign access code

Publisher: Brooks/Cole, Belmont, CA

ISBN Number - 13: 978-133-760-4741 (Loose-leaf textbook with WebAssign access code). Note: The NTCC Bookstore link is at www.ntcc.edu

Optional Instructional Materials:
Change and Motion: Calculus Made Clear, 2nd Edition; Dr. Michael Starbird, The University of Texas at Austin (24, 30 min. lectures >> available through Mr. Miller or the WHS Library).

Minimum Technology Requirements: Computer with internet access and a graphing calculator. A graphing calculator is required (TI-84 plus CE is preferred, but other models may be approved by the instructor).

Required Computer Literacy Skills: A working knowledge of Microsoft Windows and/or Mac OS, as well as a familiarity with online learning platforms such as WebAssign.
1) Communicate via email;
2) Saving and reloading saved files;
3) Navigate Blackboard to access posted materials and WebAssign assignments.

Course Structure and Overview: There will be in-class lectures for each section. It is recommended that the student read and work through the examples in the section prior to the lecture. Notes for each lecture will be posted on Blackboard as well as Canvas.

Homework assignments will consist of exercises from the textbook as well as online assignments in WebAssign.

There are 4 Exams, 4 Maple Projects (more information will be provided in class, each project should require no more than three hours outside of class), Quizzes will be given at the instructors discretion (scheduling of quizzes will be based on overall student performance in class and homework assignments), the class will end with a Comprehensive Final Exam.

Communications: Questions can be directed to the instructor in class, during office hours, or via email (mike.miller@winnsboroisd.org or mmiller@ntcc.edu). Emails will be answered within 24 hours. A Remind 101 account will be setup for the class and used if it becomes necessary to notify students of changes in assignment due dates, lecture schedule, school closings, etc.

The college's official means of communication is via your campus email address. I will use your campus email and Blackboard to communicate with you outside of class. Make sure you keep your campus email cleaned out and below the limit so you can receive important messages.

Institutional/Course Policy: Regular and punctual attendance at all scheduled classes is expected. Attendance is necessary for successful completion of course work.

Due dates for the WebAssign assignments have been posted in WebAssign and students must keep up with these dates in an online setting.

Cell phones must be silenced and placed out of sight during class lectures.

No late work will be accepted.

Make-up exams will not be given unless the arrangements have been made prior to the exam.

Alternate Operations During Campus Closure and/or Alternate Course Delivery Requirements
In the event of an emergency or announced campus closure due to a natural disaster or pandemic, it may be necessary for Northeast Texas Community College to move to altered operations. During this time, Northeast Texas Community College may opt to continue delivery of instruction through methods that include, but are not limited to, online through the Blackboard Learning Management System, online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor NTCC's website (http://www.ntcc.edu/) for instructions about continuing courses remotely, Blackboard for each class for course-specific communication, and NTCC email for important general information.

Additionally, there may be instances where a course may not be able to be continued in the same delivery format as it originates (face-to-face, fully online, live remote, or hybrid). Should this be the case, every effort will be made to continue instruction in an alternative delivery format. Students will be informed of any changes of this nature through email messaging and/or the Blackboard course site.

NTCC Academic Honesty/Ethics Statement:
NTCC upholds the highest standards of academic integrity. The college expects all students to engage in their academic pursuits in an honest manner that is beyond reproach using their intellect and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. This course will follow the NTCC Academic Honesty and Academic Ethics policies stated in the Student Handbook. Refer to the student handbook for more information on these subjects.

ADA Statement:
It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to request accommodations. An appointment can be made with the Academic Advisor/Coordinator of Special Populations located in Student Services and can be reached at 903-434-8264. For more information and to obtain a copy of the Request for Accommodations, please refer to the special populations page on the NTCC website.

Family Educational Rights and Privacy Act (FERPA):
The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

Tentative Course Timeline (*note* instructor reserves the right to make adjustments to this timeline at any point in the term):

Course Schedule: (Subject to Change)

Weeks	Topics	Assignments	Due Dates
			• Text – due at start of class. • MAPLE – by end of school day. • Webassign (Due by 11:59pm CST)
Week 1: 1/3/2022 – 1/7/2022	A Preview of Calculus, Ch. 1.1 (1/5 to 1/7 in class)	Text - p. 51 >> 1-11 all	1/10/2022
Week 2: 1/10 – 1/14	Finding Limits Graphically and Numerically, Ch. 1.2 (1/10 to 1/14 in class)	Text - p. 59-62 >> 1-19 odd, 21-28, 30, 32, 34, 40, 42, 48, 52, (63-66 W), 68, 72, (73-76 TF), (80 GR)	1/17/2022
	Quiz 1	Definition of Limit	1/14/2022
Week 3: 1/17 – 1/21	Evaluating Limits Analytically, Ch. 1.3 (1/18 to 1/21 in class)	Text - p. 71-73 >> 1-73 odd, 77, (93, 95 odd GR), (97, 98 W), 100-104, (115-120 TF), (121 Proof), (123 GR)	1/24/2022
	A Preview of Calculus, Ch. 1.1	WebAssign	1/21/2022 Friday
Week 4: 1/24 – 2/28	Continuity and One-Sided Limits, Ch. 1.4 (1/24 to 1/26 in class)	Text - p. 83-86 >> 1-57 odd, 61-69 odd, 72, 76-82 even, (83, 85, 88 W), (101, 102, 104 W), (105-110 TF), 112, 123, (126 Proof)	1/27/2022
	Finding Limits Graphically and Numerically, Ch. 1.2	WebAssign	1/25/2022 Tuesday
	Evaluating Limits Analytically, Ch. 1.3	WebAssign	1/28/2022 Friday
	Infinite Limits, Ch. 1.5 (1/27 & 1/28 in class)	Text - p. 92-94 >> 1-51 odd, 54, (55-57 W), 58-62, (65-68 TF)	1/31/2022
	Quiz 2	Finding Limits	1/28/2022

Week	Topic	Assignment	Due Date
Week 5: 1/31/2022 – 2/4/2022	The Derivative and the Tangent Line Problem, Ch. 2.1 (1/31 to 2/4 in class)	Text - p. 107-109 >> 1-27 odd, (29-35 GR), 37-41 odd, (43-48 W) 50, 53, 54, 56, 58, 62, 64, 70, 71, 73, 77-80, (93-96 TF)	2/7/2022
	Section Project: Graphs and Limits of Trigonometric Functions	Text - p. 94	2/7/2022
	Continuity and One-Sided Limts, Ch. 1.4	WebAssign	2/1/2022 Tuesday
	Infinite Limits, Ch. 1.5	WebAssign	2/4/2021 Friday
	Quiz 3	Continuity and Infinite Limits	2/4/2022
Week 6: 2/7 – 2/11	Basic Differentiation Rules and Rates of Change, Ch. 2.2 (2/7 to 2/9 in class)	Text - p. 118-121 >> 1-25 odd, 31-68 odd, 70, (69-74 W), 76, 83, (85-90 TF), 93-109 odd, (114 Proof)	2/10/2022
	The Derivative and the Tangent Line Problem, Ch. 2.1	WebAssign	2/8/2022 Tuesday
	Basic Differentiation Rules, Ch. 2.2	WebAssign	2/11/2022 Friday
	Product and Quotient Rules and Higher-Order Derivatives, Ch. 2.3 (2/10 & 2/11 in class)	Text - p. 129-132 >> 1-55 odd, 58, 59-79 odd, 81-86, (87 Proof), (89 MD), 90, 91, 93, 97, (110 W), 111-114, 115, 118, (131-136 TF), 137	2/14/2022
	Quiz 4	Differentiation	2/11/2022
Week 7: 2/14 – 2/18	Product and Quotient Rule, Ch. 2.3	WebAssign	2/15/2022 Tuesday
	Limits	MAPLE Project 1	2/18/2022
Week 8: 2/21 – 2/25	**TEST 1, Ch. 1.1-2.3**	**In Class, two days: no calculator and calculator**	**2/22/2022, Tues. 2/23/2022, Wed.**
	The Chain Rule, Ch. 2.4 (2/24, 25, 28 in class)	Text - p. 140-143 >> 9-53 odd, 58, 63-79 odd, 82, 85, (93, 94 W), 100, 102, 103, 108, 112, (121-124 TF)	3/1/2022
Week 9: 2/28 – 3/4	The Chain Rule, Ch. 2.4 (2/24, 25, 28 in class)	Continued	3/1/2022
	Implicit Differentiation, Ch. 2.5 (2/1 to 3/4 in class)	Text - p. 149-151 >> 1-19 odd, 25-43 odd, 47, 50, 54, 63, (70 W)	3/7/2022
	Chain Rule, Ch. 2.4	WebAssign	3/1/2022 Tuesday
	Implicit Differentiation, Ch. 2.5	WebAssign	3/4/2022 Friday
	Quiz 5	Differentiation- Chain Rule and Implicit Differentiation	3/4/2022

Week 10: 3/7/2022 – 3/11/2022	Related Rates, Ch. 2.6 (3/7 to 3/11 in class)	Text - p. 157-160 >> 4, 6, 11-35 odd, 41, 43, 46, (47 MD), 48	3/11/2022
	Related Rates, Ch. 2.6	WebAssign	3/11/2022
	Quiz 6	Related Rates	3/11/2022
3/14/2022 – 3/18/2022 Happy Spring Break!	Extrema on an Interval, Ch. 3.1 (self-taught)	Text - p. 171-173 >> 1-43, 50, (55-56 W), 57, 61, (65-68 TF)	3/21/2022
	Rolle's and Mean Value Thm., Ch. 3.2 (self-taught)	Text - p. 178-180 >> 1, 3, 9-23 odd, 27, 34, 35, 46, 49, 56, 61, (64 W), (73-76 TF)	3/21/2022
	Extrema on an Interval, Ch. 3.1	WebAssign	3/15/2022 Tuesday
	Rolle's and Mean Value Thm., Ch . 3.2	WebAssign	3/18/2022 Friday
Week 11: 3/21 – 3/25	Increasing and Decreasing Functions, Ch. 3.3 (3/21 to 3/25 in class)	Text - p. 187-190 >> 1-47 odd, 57-69 odd, 70, (78 NGAA), 79, 81, 85, (91-96 TF)	3/28/2022
	Increasing and Decreasing Functions, Ch. 3.3	WebAssign	3/25/2022 Friday
	Quiz 7	Rolle's, MVT, and Inc./Dec. Functions	3/25/2022
	Rolle's and MVT	MAPLE Project 2	3/25/2022
Week 12: 3/28 – 4/1	Concavity and the Second Derivative Test, Ch. 3.4 (3/28 to 3/30 in class)	Text - p. 196-198 >> 1-43 eoo, 51, 52, 56, 58, 61, 65, (75-78 TF)	3/31/2022
	Concavity and the Second Derivative Test, Ch. 3.4	WebAssign	3/29/2022 Tuesday
	Limits at Infinity, Ch. 3.5 (3/31 in class)	Text - p. 206-208 >> 5-10, 19-37 odd, (49 NGAA), 51, 52, (53 W), 56, 58	4/4/2022
	Quiz 8	Concavity, Limits at Infinity	4/1/2022
	Limits at Infinity, Ch. 3.5	WebAssign	4/1/2022 Friday
Week 13: 4/4 – 4/8	**TEST 2, Ch. 2.4-6 and Ch. 3.1-5**	**In Class, two days: no calculator and calculator**	**4/4/2022 4/5/2022**
	Sketching Curves, Ch. 3.6 (4/6 to 4/8 in class)	Text - p. 215-218 >> 1-7 odd, 9-35 odd, 29, 45, 47, 49, 51-56, (63, 64 W), 65, 78	4/11/2022
	Quiz 9	Sketching Curves	4/8/2022
	The Second Derivative	MAPLE Project 3	4/8/2022
Week 14: 4/11 – 4/15	Sketching Curves, Ch. 3.6	WebAssign	4/12/2022 Tuesday
	TEST 3, Ch. 3.6	**In Class, one day: no calculator**	**4/13/2022**
	Optimization, Ch. 3.7 (4/15 & 4/16 in class)	Text - p. 224-228 >> 3-9 odd, 17-39 odd, 43, (46 NGAA), 48, 49	4/19/2022
Week 15: 4/18 – 4/22	Differentials, Ch. 3.9 (4/18 to 4/20 in class)	Text - p. 240-241 >> 25-39 odd, 40, 41, (47 W), (49-53 TF)	4/21/2022
	Optimization, Ch. 3.7	WebAssign	4/19/2022 Tuesday
	Differentials, Ch. 3.9	WebAssign	4/22/2022 Friday

	Antiderivatives and Indefinite Integrals, Ch. 4.1 (4/21 & 4/22 in class)	Text - p. 255-257 >> 11-35 odd, 41, 43, 49-51, 53-59 odd, 65, 67, (73-78 TF)	4/25/2022
Week 16: 4/25/2022 – 4/29/2022	Area, Ch. 4.2 (4/25 to 4/27 in class)	Text - p. 267-269 >> 1-53 odd, (73, 74 TF)	4/28/2022
	Antiderivatives and Indefinite Integrals, Ch. 4.1	WebAssign	4/26/2022 Tuesday
	Quiz 10	Optimization and Differentials	4/29/2022
	Area, Ch. 4.2	WebAssign	4/29/2022 Friday
Week 17: 5/2 – 5/6	Riemann Sums and Definite Integrals, Ch. 4.3 (5/2 & 5/3 in class)	Text - p. 277-280 >> 1-43 odd, 47, 50, (63-68 TF)	5/4/2022
	Quiz 11	Integrals, Area, Reimann Sums	5/3/2022
	Riemann Sums and Definite Integrals, Ch. 4.3	WebAssign	5/3/2022 Tuesday
	The Fundamental Theorem of Calculus, Ch. 4.4 (5/4 to 5/6)	Text - p. 292-295 >> 1, (5, 7 GR), 9-51 odd, 53, 56, 60, 62, 65, 69, 71, 81-91 odd, 95-103 odd, (109, 110 TF)	5/9/2022
	Integrals	MAPLE Project 4	5/6/2022
	Quiz 12	Fundamental Thm. of Calculus	5/6/2022
	The Fundamental Theorem of Calculus, Ch. 4.4	WebAssign	5/6/2022 Friday
	Section Project: Demonstrating the Fundamental Theorem	Text - p. 296	5/9/2022
Week 18: 5/10 – 5/14	**TEST 4, Ch. 3.7-9, 4.1-4**	**In Class, two days: no calculator and calculator**	**5/9/2022 5/10/2022**
	Final Exam: Comprehensive	**3 hours (4:00-7:00 PM), WHS, rm. 11, Ch. 1.1-4.4**	**5/12/2022**