



Math 2414.021 “Hybrid” Calculus II

Course Syllabus: Spring 2021 R @ 11:00 MS - 130

“Northeast Texas Community College exists to provide responsible, exemplary learning opportunities.”

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| Office Hours | Monday | Tuesday | Wednesday | Thursday | Friday | Online |
|--------------|--------------------|------------|-------------------------|------------|--------------------|----------|
| | Online Appointment | 9:30-10:50 | 9:30-10:50 1:30-2:50 | 9:30-10:50 | Online Appointment | Everyday |

The information contained in this syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Catalog Course Description

This is a standard second course in calculus. Topics include differentiation and integration of transcendental functions; parametric equations and polar coordinates; techniques of integration; sequences and series; improper integrals. Four hours credit.

Prerequisite(s): MATH 2413 or equivalent with a grade of “C” or better

Required Textbook(s):

Calculus Volume 2

Publisher: OpenStax

ISBN Number: 10: 1-938168-06-2

Rice University

6100 Main Street MS-375

Houston, TX 77005

Recommended Reading(s): None

Student Learning Outcomes:

Upon successful completion of this course, students will

2414.1 Use the concepts of definite integrals to solve problems involving area, volume, work, and other physical applications.

2414.2 Use substitution, integration by parts, trigonometric substitution, partial fractions, and tables of anti-derivatives to evaluate definite and indefinite integrals.

2414.3 Define an improper integral.

2414.4 Apply the concepts of limits, convergence, and divergence to evaluate some classes of improper integrals.

2414.5 Determine convergence or divergence of sequences and series.

2414.6 Use Taylor and MacLaurin series to represent functions.

2414.7 Use Taylor or MacLaurin series to integrate by conventional methods.

2414.8 Use the concept of polar coordinates to find areas, length of curves, and representations of conic sections.

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.

College 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.

SCANS Skills: N/A

Lectures & Discussions:

This is a hybrid learning course that is part face to face and part online. It is identical to classroom courses in terms of learner outcomes, course objectives and instructor expectations. A student desiring to enroll for this course should possess the following: Access to the internet, an e-mail address, a general knowledge of browser settings, file attachments, uploading and downloading files, word processing packages, the ability to conduct on-line research and learn independently and the initiative to use Blackboard discussion board, chat and email.

Course Outline:

Submission of homework problems will be determined on a section-by-section basis. Changes on individual problem sets may be made weekly.

{The following sections and problems are for Midterm submission.}

Sections and Problems Assigned, Multiples of 7 i.e. {7, 14, 21, ... , 77, ... , last multiple of seven}

Chapter 1: Integration

- 1.1 Approximating Areas
- 1.2 The Definite Integral
- 1.3 The Fundamental Theorem of Calculus
- 1.4 Integration Formulas and the Net Change Theorem
- 1.5 Substitution
- 1.6 Integrals Involving Exponential and Logarithmic Functions
- 1.7 Integrals Resulting in Inverse Trigonometric Functions

Chapter 2: Application of Integration

- 2.1 Areas between Curves
- 2.2 Determining Volumes by Slicing
- 2.3 Volumes of Revolution: Cylindrical Shells
- 2.4 Arc Length of a Curve and Surface Area
- 2.5 Physical Applications
- 2.6 Moments and Centers of Mass
- 2.7 Integrals, Exponential Functions, and Logarithms
- 2.8 Exponential Growth and Decay
- 2.9 Calculus of the Hyperbolic Functions

Chapter 3: Techniques of Integration

- 3.1 Integration by Parts
- 3.2 Trigonometric Integrals
- 3.3 Trigonometric Substitution
- 3.4 Partial Fractions
- 3.5 Other Strategies for Integration
- 3.6 Numerical Integration
- 3.7 Improper Integrals

{Midterm Homework and Examination Due March 11th, 2021}

{The following sections and problems are for Final submission.}

Sections and Problems Assigned, Multiples of 7 i.e. {7, 14, 21, ... , 77, ... , last multiple of seven}

Chapter 5: Sequences and Series

- 5.1 Sequences
- 5.2 Infinite Series
- 5.3 The Divergence and Integral Tests
- 5.4 Comparison Tests
- 5.5 Alternating Series
- 5.6 Ratio and Root Tests

Chapter 6: Power Series

- 6.1 Power Series and Functions
- 6.2 Properties of Power Series
- 6.3 Taylor and Maclaurin Series
- 6.4 Working with Taylor Series

Chapter 7: Parametric Equations and Polar Coordinates

- 7.1 Parametric Equations
- 7.2 Calculus of Parametric Curves
- 7.3 Polar Coordinates
- 7.4 Area and Arc Length in Polar Coordinates
- 7.5 Conic Sections

{Final Homework and Examination Due May 13th, 2021}

Evaluation/Grading Policy:

Two major 150 point examinations, a midterm and a final, will be given to comprise 75% of the final grade. The average of a series of special assignments, online engagements, and homework exercises totaling 100 points will be worth 25% of the final grade.

| | |
|---------------|------|
| 2 Major Exams | 75% |
| Weekly Grade | 25% |
| TOTAL | 100% |

Make-up exams will not be given unless the student has coordinated with the instructor at least two days prior to the exam. Late work will incur a penalty of 10 points per day for whatever reason for the absence, unless otherwise indicated by the instructor.

Grading System

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

Other Course Requirements:

A graphing calculator is highly recommended for this course, but not required.

Student Responsibilities/Expectations:

Regular and punctual attendance at all scheduled classes is expected. Attendance is necessary for successful completion of course work. Excused absences may be permitted at the discretion of the instructor for illness, official college activities, or personal emergencies. The student is responsible for initiating procedures for make-up work. All makeup work will be in conjunction with the final exam.

NTCC Academic Honesty Statement:

"Students are expected to complete course work in an honest manner, using their intellects and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. NTCC upholds the highest standards of academic integrity. This course will follow the NTCC Academic Honesty policy stated in the Student Handbook."

Academic Ethics

The college expects all students to engage in academic pursuits in a manner that is beyond reproach. Students are expected to maintain complete honesty and integrity in their academic pursuit. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. Refer to the student handbook for more information on this subject.

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

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 special population 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.

NTCC Campus Carry Policy:

Please review the [Campus Carry Policy](#) at the provided link.

Other Course Policies:

Cell phone usage in the classroom will be coordinated by the professor. Students will be warned when using a phone inappropriately. A student will be removed from class if any disruption continues.

The college's official means of communication is via your campus email address. I will use your campus email address 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.

Students are expected to be respectful toward classmates and professor at all times!