

Naperville North High School

Multivariable Calculus with Linear Algebra



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Mission

To educate students to be self-directed learners, collaborative workers, complex thinkers, quality producers, and community contributors

Course Description

This course is intended for those students who have completed Calculus BC. The course extends the ideas and techniques of Calculus to three dimensions. Properties of vectors and graphing in 3-space are studied first, and provide the fundamentals for the remainder of the course. Vector-valued functions and their application to particle motion and curvature are studied in detail. Functions of several variables and related applications are then examined through the use of partial derivatives and multiple integrals. Topics in vector calculus including Green's Theorem, The Divergence Theorem and Stokes Theorem are studied. This course also includes the study of Linear Algebra with topics in geometric vectors and vector space, matrices and linear transformations, inner product space, eigenvalues and eigenvectors, the determinant functions, and formal methods of mathematical proof. A CAS (Computer Algebra System) graphing calculator is required.

Course Standards

Multivariable Calculus

- Geometry of Space
- Vector valued functions
- Functions of several variables
- Multiple Integrals
- Vector Analysis

Linear Algebra

- Matrices and Linear Equations
- Geometrical Vectors
- Determinants
- Vector Spaces and Inner Product Spaces
- Eigenvalues and Eigenvectors
- Linear Transformations

Grading Practices

Grades communicate each student's progress toward mastery of goals/standards for the course.

- No extra credit will be issued.
- Violations of the academic integrity policy will be consequence by administration in collaboration with the DC/teacher.
- Any percentage lower than 50% will be put into the grade book as a 50%, the lowest possible grade on completed work (incomplete or work not turned in will be entered as a grade of 0 in the grade book).
- Missing work will be accepted up to five days after the due date with a penalty of 10% per day past the due date.

Grading Disbursement

A $\geq 89.5\%$

B $\geq 79.5\%$

C $\geq 69.5\%$

D $\geq 59.5\%$

F $< 59.5\%$

Semester Grade:

- Coursework = 85% (Tests and Quizzes = 90%, Daily Practice/In-Class Activities 10%)
- Final Exam = 15%

Academic Integrity Code Statement

District 203 students are challenged to address the academic process enthusiastically, diligently, and most importantly, honestly. It is the responsibility of our students, teachers, and administration to uphold the fundamental academic values of honesty, responsibility, fairness, respect and trust. The integrity of our district's academic programs is built upon these principles.

Academic integrity violations include, but not limited to cheating; plagiarism, self-plagiarism or copy infringement; obtaining or providing an unfair advantage; falsification of documents; unauthorized access to records; and inappropriate collaboration, whether intentional or unintentional. The classroom teacher and administration will collaborate and exercise professional judgment in determining academic integrity violations.

The use of translating devices and/or direct translation from a native speaker or tutor is strictly forbidden. You must do your own work. Remember: There is a significant difference between getting help and having something or someone else do your work for you. There are consequences both academic and non-academic for students who do not adhere to this policy. Violations will be tracked and added during your time at NNHS.

Reassessment Policy

Students will be provided multiple and varied opportunities to demonstrate mastery of learning standards. The purpose of reassessment is to allow students to demonstrate mastery of course standards in which they remain deficient.

- Students will be required to engage in further learning and reassessment when students do not demonstrate sufficient learning of the course essential standards.
- Students who have demonstrated sufficient learning of the essential standards (but scored below 80%), will be allowed reassessment opportunities on unit assessments if they so choose. To be eligible for reassessment, students must demonstrate readiness for the summative assessment through completion of teacher determined activities.
- Reassessments MUST be completed within 5 days of receiving feedback from the teacher.
- Higher reassessment grades will replace the original assessment score (but will not exceed 80%).

Additional Resources for Support

- Make an appointment with your teacher: before school, after school, or during the school day
- Drop in for Peer Tutor/Math Help before school or during lunch periods through the Literacy Center.
- After-School Tutoring in Learning Commons (check with Student Services for schedule.)
- Online Resources:
 - Canvas (notes, practice): <https://naperville.instructure.com>
 - Khan Academy Multivariable Calculus: <https://www.khanacademy.org/math/multivariable-calculus>
 - Khan Academy Linear Algebra: <https://www.khanacademy.org/math/linear-algebra>

Parents & Guardians/Communication

Naperville North believes in a collective partnership with parents/guardians which provides students the best opportunities for success.

Some ways parents/guardians can support their student's learning are:

- Encourage your student to speak directly with their teacher about questions or concerns.
- Actively check Infinite Campus for their student's grade.
 - Infinite Campus is a tool to monitor student progress until final course grade is posted.
 - Monthly progress grades are posted and represent the current grade of a student in the course at that moment in time.

- Discuss missing assignments, reiterate due dates, help organize folders, materials, assignment notebooks and review upcoming projects and assessments.
- Teachers make every effort to respond to parent emails and phone calls within 24 hours during the work week.
- The best way to communicate with teachers is through email; however, if you haven't received a response within 48 hours, please resend the email or call their voicemail. Your email may have been filtered.