

MATH 2110 Calculus and Analytic Geometry III

Instructor Information:

Name
Office phone
Office location
Office hours
E-mail address

I. Course Description

A continuation of MATH 1920 and the third course in the traditional three-course calculus sequence. Topics include solid analytical geometry, the calculus of more than one independent variable, surfaces and curves in space, cylindrical and spherical coordinate systems, vectors and vector-valued functions, partial derivatives, multiple integrals, and applications.

Credit Hours: 4 credits 4 class hours

Prerequisite: MATH 1920

II. Course Outcomes and Topics

Upon successful completion of this course, students will:

- Calculate operations on three-dimensional vectors, including the dot product and cross product, and determine what the results reveal about the relationship between the vectors.
- Classify cylinders and quadric surfaces from their equations.
- Write the equations of lines and planes and determine whether a set of lines is parallel, intersecting, or skew.
- Solve projectile motion applications using vector functions and explain the results.
- Use partial derivatives to find a linear approximation for a function of two variables.
- Apply the method of Lagrange multipliers to optimize a function subject to given constraints.
- Evaluate double integrals over rectangular and bounded regions, including the use of polar coordinates to find the volume of a solid.

Topics

- Three-Dimensional Coordinate Systems
- Vectors
 - The Dot Product
- The Cross Product
- Equations of Lines and Planes
- Cylinders and Quadric Surfaces
- Cylindrical and Spherical Coordinates
- Vector Functions/Space Curves
- Derivatives/Integrals/Vector Functions
- Arc Length and Curvature
- Motion in Space/Velocity/Acceleration
- Functions of Several Variables
- Limits and Continuity
- Partial Derivatives
- Tangent Planes/Linear Approximations
- The Chain Rule
- Directional Derivatives/Gradient Vector
- Maximum and Minimum Values
- Lagrange Multipliers
- Double Integrals Over Rectangles
- Iterated Integrals
- Double Integrals/General Regions
- Double Integrals/Polar Coordinates
- Applications of Double Integrals
- Surface Area
- Triple Integrals
- Triple Integrals/Cylindrical/Spherical Coordinates
- Change of Variables/Multiple Integrals

III. Materials

Students must check with the instructor before purchasing any materials

- **Required: *Calculus, Early Transcendental Functions*, 5th Edition by Larson and Edwards (Publisher: Cengage, ISBN: 0538735503)**
- **Recommended: *Student Solutions Manual*, ISBN: 0547213107**
- Calculator/software: A graphing calculator is strongly recommended or required. The **TI-84+** calculator will be the demonstration tool in the classroom. Some software may be used. (The instructor will clarify.)

IV. Course Policies

Attendance:

Each Instructor will provide information regarding his/her attendance policy. Failure to attend class will result in a final course grade of "FA" or "FN" (see explanation below) depending on the individual instructor's course policy.

FA= failure, attendance-related (unofficial withdrawal) Last recorded date of attendance required

FN= failure, never attended class (unofficial withdrawal)

Method of Evaluation:

Grading: 90-100 A, 80-89 B, 70-79 C, 60-69 D, below 60 F

The instructor will clarify specific examination, homework, and other methods of evaluation.

Student Communication Channels

It is the student's responsibility to check NS Online (D2L) and MyNSCC email on a regular basis. These are the official communication channels between the college and students. Students are responsible for the information communicated through those channels. NS Online contains specific course information and MyNSCC contains information important for other purposes.

V. ADA Statement

Nashville State Technical Community College complies with the Americans with Disabilities Act. If you wish to request any special accommodations for any courses in which you are enrolled, contact the Disability Coordinator at 353-3721. Such services must have proof of documentation that is not over three years old.

VI. Classroom Behavior

Nashville State Community College has a zero tolerance policy for disruptive conduct in the classroom. Students whose behavior disrupts the classroom will be subject to disciplinary sanctions.

The instructor has primary responsibility for control over classroom behavior and maintenance of academic integrity. He/she can order temporary removal or exclusion from the classroom of any student engaged in disruptive conduct or in conduct which violates the general rules and regulations of the College.

Disruptive behavior in the classroom may be defined as, but is not limited to, behavior that obstructs or disrupts the learning environment (e.g., offensive language, harassment of students and professors, repeated outbursts from a student which disrupt the flow of instruction or prevent concentration on the subject taught, failure to cooperate in maintaining classroom decorum, etc.), the continued use of any electronic or other noise or light emitting device which disturbs others (e.g., disturbing noises from beepers, cell phones, palm pilots, lap-top computers, games, etc.).

Please be aware that children are not allowed in class or unattended on campus.

Academic Dishonesty (Honor Code)

Any form of academic dishonesty, cheating, plagiarizing, or other academic misconduct

is prohibited. "Plagiarism may result from: (1) failing to cite quotations and borrowed ideas, (2) failing to enclose borrowed language in quotation marks, and (3) failing to put summaries and paraphrases in your own words" (A Writer's Reference 331). Academic dishonesty may be defined as, but is not limited to, intentionally trying to deceive by claiming credit for the work of another person, using information from a web page or source without citing the reference, fraudulently using someone else's work on an exam, paper, or assignment, recycling your own work from another course, purchasing papers or materials from another source and presenting them as your own, attempting to obtain exams/materials/assignments in advance of the date of administration by the instructor, impersonating someone else in a testing situation, providing confidential test information to someone else, submitting the same assignment in two different classes without requesting both instructor's permission, allowing someone else to copy or use your work, using someone else's work to complete your own, altering documents, transcripts or grades, and forging a faculty/staff member's signature.

In addition to other possible disciplinary sanctions that may be imposed through regular college procedures as a result of academic dishonesty the instructor has the authority to assign an "F" or a "Zero" for the exercise, paper, or examination or to assign an "F" for the course.

NOTE: This syllabus is meant simply as a guide and overview of the course, the topics, the objectives, the general assessments, and some standard college policies. Some items are subject to change or revision at the instructor's discretion. Each instructor will further clarify their criteria for grading, classroom procedures, attendance, exams and dates, etc.