
CATALOG DESCRIPTION
This is a Texas Common Course Number.
Prerequisite Required: MATH 2414 or equivalent
Course Description: This course is a study of advanced topics in calculus including vectors and vector-valued functions, partial differentiation, Lagrange multipliers, multiple integrals, and Jacobians; application of the line integral including Green's Theorem, the Divergence Theorem, and Stokes' Theorem. (4 Lec)
Coordinating Board Academic Approval Number 2701016119

STUDENT LEARNING OUTCOMES
Upon successful completion of this course, students will:
1. Perform calculus operations on vector-valued functions, including derivatives, integrals, curvature, displacement, velocity, acceleration, and torsion.
2. Perform calculus operations on functions of several variables, including partial derivatives, directional derivatives, and multiple integrals.
3. Find extrema and tangent planes.
4. Solve problems using the Fundamental Theorem of Line Integrals, Green's Theorem, the Divergence Theorem, and Stokes' Theorem.
5. Apply the computational and conceptual principles of calculus to the solutions of real-world problems.

COURSE OBJECTIVES
1. Perform operations on plane and space vectors including dot products and cross products.
2. Find the equation of lines/planes in space and identify/sketch surfaces.
4. Find the velocity and acceleration vector functions for a given position function and use them to solve projectile motion problems.
5. Find the unit tangent, unit normal, tangential/normal components of acceleration, arc length and curvature for given vector-valued space curve.
6. Find limits, partial derivatives, gradient, and directional derivatives for given functions of two variables.
7. Find the equation of tangent planes and normal lines to a given surface.
8. Determine relative extrema of given surfaces f (x,y) and maximize/minimize functions subject to given constraint using Lagrangian Multipliers.
9. Evaluate double integrals and use them to find areas of plane regions, volumes of solids, center of mass and moments of plane regions, and surface areas.
10. Evaluate triple integrals and use them to find volumes, mass, center of mass and moments in rectangular, cylindrical and spherical coordinate systems.
11. Given a vector field, find the curl, divergence, determine whether it is conservative, and find the potential function for conservative fields.
12. Evaluate line integrals over specified paths using either parameterization or the Fundamental Theorem of Line Integrals depending on whether the integral is independent of path.
13. Evaluate surface integrals over a specified plane region and use them to find flux.
14. Use the Divergence Theorem to evaluate surface integrals, Green's Theorem to evaluate line integrals around closed plane curves, and Stoke's Theorem to evaluate line integrals around closed curves on a surface

CHAPTERS/UNITS COVERED
Chapter 10: Vectors and the Geometry of Space
Chapter 11: Partial Derivatives
Chapter 12: Multiple Integrals
Chapter 13: Vector Calculus
INSTRUCTOR: Mark Burton
E-MAIL: mburton@dcccd.edu

MATH 2415 –23501
SEMESTER: Spring 2020

This class meets on Tuesdays and Thursdays from 7:10 pm to 9:00 pm in X2007. For special help students are encouraged to come to the STEM Resource Center, K137 during hours when tutors for your course are available. Consult your instructor or check the bulletin board in K137 for the appropriate hours.

INSTITUTIONAL POLICIES
Institutional Policies of Brookhaven College may be found at the following link: https://www.Brookhavencollege.edu/syllabusaddendum

The institutional policies covered are:
- Drop/Withdrawal Policy
- Six Drop Rule
- Repeating this Course
- Financial Aid Statement
- Financial Aid Certification of Attendance
- International Students
- Religious Holidays
- ADA Statement
- Academic Integrity
- Grade Reports
- Family Educational Rights and Privacy Act (FERPA)
- Institutional Equity
- Instructors Right to Modify

IMPORTANT DATE
The last day to withdraw from the course with a “W” is Thur, April 16. Students sometimes drop a class when help is available that would enable them to continue. Please discuss your plans with the instructor if you feel you need to withdraw.

IMPORTANT NOTE
We, the Math Department of BHC, take issues of dishonesty very seriously. If a student is caught violating any policy of the Testing Center, or an instructor’s own policy for their particular class, the following consequences will be enforced: The minimum penalty a student will receive is a zero for the assignment/exam and the maximum penalty will be to receive an F for the course and/or academic suspension.

CLASSROOM EXPECTATIONS
You are to arrive on time to class and turn off cell phones or put them on vibrate when entering the classroom. If you receive an emergency call, please step outside of the classroom to take the call. Text messaging is not allowed during class time. In addition, cell phones and pagers are not allowed in the Testing Center.

EVALUATION PROCEDURES
Weekly quizzes and four chapter exams will determine your final course grade, with quiz average counting 10% and each of the four chapter exams counting 22.5%. (The last chapter exam will be given during finals week in lieu of a comprehensive final exam.) The weekly quizzes will consist of select homework problems assigned on the Daily Schedule appearing later in this syllabus. The lowest daily quiz score will be dropped, but NO CHAPTER EXAM SCORES WILL BE DROPPED. All quizzes and chapter exams tests will occur in class during regular class hours. THERE IS NO PROVISION FOR MAKE-UP QUIZZES OR CHAPTER EXAMS. The grading scale (in percent) used to determine the course grade is: A=90-100, B=80-89, C=70-79, D=60-69, F=0-59.

TI Graphing calculator required. TI-84 PLUS calculator recommended. NO TI-89 OR TI-92 OR TI-NSPIRE.

Incomplete grades are given when an unforeseen emergency prevents a student from completing the work in a course. The division Dean must approve all “I” grades.
### Daily Schedule for MATH 2415-23501 – Calculus III

**Spring 2020 - Tue/Thur 7:10 pm to 9:00 pm - X2007 - M. Burton, Instructor**

<table>
<thead>
<tr>
<th>DAY</th>
<th>SECTIONS &amp; TOPICS</th>
<th>Homework - (see note below)</th>
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<tbody>
<tr>
<td>Tue-Jan 21 thru Tue-Feb 11</td>
<td>10.1 - Three-Dimensional Coordinate Systems</td>
<td>5,7,9,15,19,23,25,27,29,31,35,37,39,41,43</td>
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<td>10.2 - Vectors</td>
<td>2,5,11,15,19,21,25,27,31,33,37,39,43</td>
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<td>10.3 - The Dot Product</td>
<td>1,5,9,17,19,23,27,31,35,37,39,41,43</td>
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<td>10.4 - The Cross Product</td>
<td>3,7,13,19,27,31,35,37,39,41,43,45,47,49</td>
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<td>10.5 - Equations of Lines and Planes</td>
<td>5,7,9,13,15,19,21,23,25,27,29,33,39,41,49</td>
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<td>10.6 - Cylinders and Quadric Surfaces</td>
<td>11,13,17,21,23,25,27,29</td>
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<td>10.7 - Vector Functions and Space Curves</td>
<td>13,25,29,33,35,39,43,45,47,49,53,57,61,65</td>
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<td>10.8 - Arc Length and Curvature</td>
<td>3,7,11,13,17,21,25,27,29</td>
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<td>10.9 - Motion in Space: Velocity and Acceleration</td>
<td>3,9,11,15,17,19,23,27,29,33</td>
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#### Tests
- **Test 1 (Chapter 10) in Class**
- **Test 2 (Chapter 11) in Class**
- **Test 3 (Chapter 12) in Class**
- **Test 4 (Chapter 13) in Class**

**OTHER IMPORTANT DATES**

- **Thur-Feb 27** - Professional Development Day – No Class
- **Tue-Mar 17 and Thur-Mar 19** - Spring Break – No Class
- **Thur-Apr 16** - Last Day to Withdraw

**Note:** In addition to the Chapter Tests, there will be two in class quizzes per chapter. Each quiz will consist of 2-4 homework problems from previous assignments. The lowest quiz score will be dropped at the end of the semester. No Chapter Tests will be dropped. **There is no make-up provision for Chapter Tests or quizzes.**

The overall grade average will be 90%(Test_Average)+10%(Quiz_Average).

This is a tentative schedule. Instructor has the right to add, delete, or modify elements in this schedule.