I. COURSE DESCRIPTION:

MTH 277 presents vector valued functions, partial derivatives, multiple integrals, and topics from the calculus of vectors. Designed for mathematical, physical, and engineering science programs. Prerequisite: MTH 174 or equivalent.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon completion of this course, the student should be able to:

1. Perform operations on vectors in the plane and 3D space
2. Compute and apply dot and cross products
3. Write equations for lines and planes in space
4. Perform differentiation and integration of vector valued functions
5. Interpret vector valued functions in the context of velocity and acceleration, tangent and normal vectors, and arc length and curvature
6. Define surfaces in space through multivariable functions
7. Understand limits, continuity and differentiation as applied to multivariable functions
8. Compute and interpret differentials, directional derivatives, and gradients
9. Construct equations of tangent planes and normal lines
10. Find optimal values of multivariable functions
11. Solve constrained optimization problems using Lagrange multipliers
12. Compute and interpret iterated, double and triple integrals
13. Perform integration in polar, spherical, and cylindrical coordinate systems
14. Calculate center of mass and moments of inertia of regions and solids
15. Sketch and interpret vector fields
16. Compute line integrals of both scalar functions and vector fields, and interpret in terms of physical applications
17. Understand and apply Green’s Theorem
18. Effectively use technology as an aid to modeling, visualizing, understanding, and applying the concepts presented.
III. EVALUATION AND REQUIREMENTS:

Email Correspondence: To protect your privacy, your business with Blue Ridge Community College is conducted only through your college-provided email account. Please use this account to contact your instructors, or when you are conducting other business with BRCC. Your instructors will use this address to contact you as well.

Attendance Policy (seated -01 section): The student is expected to attend all classes. If an absence is unavoidable, it is the student’s responsibility to contact the instructor regarding material covered and assignments made. Permission to make up missed exams is granted at the discretion of the instructor. The circumstances causing the absence from an exam must be discussed with the instructor before the next regularly scheduled class meeting, and if permission to make up the exam is granted, it must be done in a timely manner in the Learning Assistance Center (G202).

Attendance Policy (online -V01 section): “Attendance” in an online section is defined by some evidence of participation in the course. Actions such as “submitting assignments on time,” and “communicating with your instructor” demonstrate that you are actively engaged in the course. Please be aware that BRCC policy allows for students to be dropped for non-participation in the first few weeks of the course, and that for virtual sections, merely logging into Blackboard does not constitute “participation.” If you’re in an online section of any course, be sure to check your VCCS email daily - your instructor may be trying to communicate something important to you, and a lack of response can be taken as “not participating”!

For both sections, notes, lectures, and worked problems will be available online. The midterm and final are on site proctored assessments, in accordance with VCCS recommendations for distance learning. Seated section exams are in-class at scheduled class times. Virtual section exams may be taken in the Testing Center at BRCC, or you may make arrangements with the testing center of your local college.

Cancelled Classes: Unscheduled class cancellations may occur, sometimes college-wide (e.g. weather) and sometimes due to instructor emergencies. Online sections are generally unaffected by class cancellations (unless the event manages to take out our power, and thus, our server!), but for the seated section, be aware that if we have a cancellation, the expectation is that you will make up the missed class by working through the posted material that was scheduled for that day’s class session.

Notification of college-wide closures will be posted on the main BRCC home page, and you are encouraged to sign up for BRCC’s Emergency Alert Service to receive texts: https://community.brc.edu/emergency/.

In the event I need to cancel, I’ll try to both post as an announcement and email you all as well. That’s another reason to check your VCCS email daily!

Grading Policy: Your grade will be calculated using a weighted average. The types of assignments and weights are given below:

- Nine graded assignments* (50%)
- Three tests (50%)
*I’ll drop the lowest graded assignment with the caveat that all assignments must be attempted. In other words, you can’t skip an assignment / chunk of material and say “just make that my drop.” You’re responsible for all the material, but as long as you make a reasonable stab at all nine of them, I will drop the lowest. Skip one, and I won’t drop it – it’ll go in as a zero!

Letter grades are assigned on the ten point scale:
- A = 90 – 100
- B = 80 – 89
- C = 70 – 79
- D = 60 – 69
- F = below 60

IV. TEXT:

Course content is web based and not text specific. A Calculus text which covers the topics in the objectives list is necessary as a reference – i.e. use whatever your freshman Calc textbook was.

V. INSTRUCTIONAL MATERIALS:

Internet access is required, and access to high speed Internet (cable, DSL) is strongly recommended. Software requirements are detailed on the course website.

This course has both a Blackboard shell (access through MyBRCC: https://br.my.vccs.edu/jsp/login.jsp ) and a supplementary website (http://academic.brcc.edu/ryanl/MTH_277/ ). The Blackboard site is where the secure stuff lives, like your grades, and solutions to assignments. The supplementary website is where most of the content (lectures, practice problems, etc) lives, and is a free and open public resource. You can get to it directly from the link (and can access the material there at any time, even after this course ends), and it’s also linked from within the Blackboard shell.

VI. HONOR POLICY:

"The functioning of an academic community depends on the integrity of all of its members. Blue Ridge Community College values truthfulness, respect for the property of others, and honesty in academic work."

BRCC Honor Code: http://www.brcc.edu/academics/honor_code

As a member of this community, you are responsible for understanding and adhering to the Honor Code. Violations include (but are not limited to) cheating on tests and quizzes, unauthorized collaboration on assignments, and plagiarism. Your instructor is the ultimate source of policy on individual assignments; please consult me if you have any questions or concerns about what is permitted.

Violations of the Honor Code may result in a grade penalty and or disciplinary action. The Statement on Student Rights and Responsibilities, and the Statement on Academic Honesty below, located in Catalog and Student Handbook at http://www.brcc.edu/catalog, provide specific guidelines which encompass this code.
VII. **DISABILITY SERVICES:**

If you have a disability and wish to be considered for an accommodation, please make an appointment with the Office of Disability Services located in the Houff Student Center.

The purpose of providing accommodations is to ensure that students with disabilities are granted the opportunity to access programs and services offered by the College. Requested accommodations are considered on a case by case basis by the Coordinator of Disability Services who works with faculty to ensure both access and academic standards are maintained. Students requesting services must meet with the Disability Services Coordinator and provide sufficient documentation of the disability prior to receiving accommodations. Accommodations are not retroactive and do not result in modification of the essential academic elements of the course.

VIII. **DISTANCE LEARNING POLICY (–V01 online section):**

Students will be required to take three proctored tests. The tests will be given in the BRCC Testing Center, or you may make arrangements with your instructor to take the proctored test/exam at any other college, university or military testing center.

Tests/Exams taken at the BRCC testing center are at no charge. Students that live outside the BRCC service area and arrange to take the test or exam at another site are responsible for any fees associated with test proctoring at the selected site.

Test dates for the seated section are published in the syllabus. You must take that test/exam within the week that the test is scheduled. Do not wait until the last minute to take the test/exam as seats are limited. You must present a photo ID to take the test. For BRCC Testing Center hours and other testing information see [http://www.brcc.edu/services/testingcenter](http://www.brcc.edu/services/testingcenter).
## IX. CLASS SCHEDULE AND SEQUENCE OF INSTRUCTION:

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<tr>
<th>WEEK</th>
<th>COMPLETE MODULES</th>
<th>ASSIGNMENT DUE DATES</th>
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| Week 1: 8/24/15 | Module 1: Defining a vector  
Module 2: Vector addition and scalar multiplication  
Module 3: The dot product  
Module 4: The cross product |                                        |
| Week 2: 8/31/15 | Module 5: Lines and planes  
Module 6: Vector valued functions | Graded assignment 1 (modules 1-4)  
9/2/15                                         |
| Week 3: 9/7/15  | Module 7: Calculus of vector valued functions | Graded assignment 2 (module 5)  
9/7/15 *see assignment page for schedule note * |
| Week 4: 9/14/15 | Module 8: Applications of vector valued functions |                                        |
| Week 5: 9/21/15 | Catch up and review for test one  
Module 9: Functions of several variables | Graded assignment 3 (modules 6-8)  
9/21/15                                        |
| Week 6: 9/28/15 | Module 10: Calculus of multivariable functions | Test one covers modules 1-8  
9/28/15                                        |
| Week 7: 10/5/15 | **No class 10/5 – FALL BREAK**  
Module 10: Calculus of multivariable functions  
Module 11: The chain rule |                                        |
| Week 8: 10/12/15 | Module 11: The chain rule  
Module 12: Applications of partial differentiation |                                        |
| Week 9: 10/19/15 | Module 13: Optimization  
Module 14: Iterated and double integrals | Graded assignment 4 (modules 9-11)  
10/19/15                                        |
| Week 10: 10/26/15 | Module 14: Iterated and double integrals | Graded assignment 5 (modules 12-13)  
10/26/15                                        |
| Week 11: 11/2/15 | Catch up and review for test two  
Module 15: Triple integrals | Graded assignment 6 (module 14)  
11/2/15                                        |
| Week 12: 11/9/15 | Module 15: Triple integrals | Test two covers modules 9-14  
11/9/15                                        |
| Week 13: 11/16/15 | Module 16: Applications of double and triple integrals  
Module 17: Vector fields and line integrals |                                        |
| Week 14: 11/23/15 | Module 17: Vector fields and line integrals  
**No class 11/25 - THANKSGIVING** | Graded assignment 7 (modules 15-16)  
11/23/15                                        |
| Week 15: 11/30/15 | Module 18: Green's Theorem, Stokes' Theorem, Divergence Theorem | Graded assignment 8 (module 17)  
11/30/15                                        |
| Week 16: 12/7/15 | Catch up and study for "final" (test three) | Graded assignment 9 (module 18)  
12/7/15                                        |

Exam week: 12/14/15  
In class “final” (test three) covers modules 15-18  
12/14/15, 2:00-4:00 PM

**Important Dates:** Last day to add is August 23; last day to drop with refund is September 10; last day to drop w/o grade penalty is November 2.  
A complete academic calendar is at [http://www.brcc.edu/Student/academic_calendar.htm](http://www.brcc.edu/Student/academic_calendar.htm)
X. HOMEWORK POLICY:

There’s a long story about why I’m cranky about homework in this class, and if you’re in the in-class class, you’ll have to hear all about it ☺ Believe me. I’m going to try to terrify you into compliance.

The summary is

**ASSIGNMENTS ARE DUE THE DAY THAT THEY ARE DUE.**

Not some other day. Not three weeks later. Not “right after I have my Physics test.”

You get a day’s grace period to allow for short term right before class emergencies, like a car breakdown – if you get it to me the day after it’s due, there’s no penalty. How you get it to me is up to you – under my office door, or scanned and emailed to me, or faxed. If you drop it in the US mail and it’s postmarked that day, I’ll consider it OK.

*After that, assignments lose 10% a day for every day late.*

I will drop the lowest assignment grade at the end. This is on the condition that all assignments have at least been *attempted*. You can’t skip an assignment and the corresponding chunk of material.

If something unfortunate happens to you that you’re out long term...well, the nice thing is, this originally started out as an online class, and all the content is online. So while you’re sitting at home with that broken leg, you can still keep up with the material, and hand your assignments over to a friend to turn in. Got the flu? Well, you don’t have to come in and infect us all! Isn’t that great how that all works out?! And if you’re dysfunctional for a week or two, you have a sick day – assignments only come due every week or two, so the drop has you covered – that’s your sick day.

If you go on vacation, I suggest you book a hotel with wireless access and bring a laptop.

If you are in a coma for three or more weeks, then I’d recommend a medical withdrawal at that point anyway.

If you are dead, and subsequently resurrected, follow the procedure for coma.

Thank you.
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<tr>
<th>Time</th>
<th>Monday</th>
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