Linn-Benton Community College

Course Syllabus – Winter 2022

Math 255 – Vector Calculus

Instructor Information

Instructor:	Jeff Crabill	
Office:	WOH-131	
Office Hours:	Make an appointment anytime via email or the Moodle link	
Email:	crabilj@linnbenton.edu	
Zoom :	Office hours and chatting :	Zoom room 5419174627
	Class Sessions :	See Moodle for link

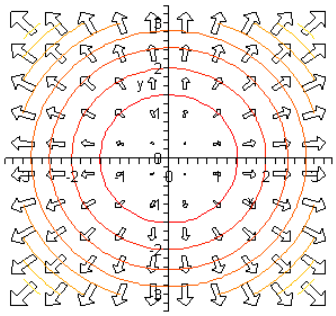
Course Information

Course Name and Title:	Math 255 – Vector Calculus
Course Credits:	4 credit hours
Registration Information:	CRN 30156 MTWF 11:00 pm on Zoom! (link in Moodle)
Prerequisite Course:	Math 254 – Multivariable Calculus
Course Description:	An intermediate treatment of multivariate calculus with a vector approach. Provides the mathematical skills for courses in advanced calculus, fluid mechanics and electromagnetic theory.

Course Website: LBCC Moodle website

Course Materials

Text: *Any Calculus Reference (Text or Online) – "Vector Calculus" chapter*
The Geometry of Vector Calculus (Free online – link in Moodle)



Class Format

Learning will always be happening in Math 255 and in a variety of forms – lectures, discussions, or group activities. Every classroom experience will be designed to elucidate a new concept and you will want to be open to those new ideas.

Each week, we will do a group activity. The structure of the activities will be explained in class. These activities are designed to introduce new concepts (some of which you'll not have seen before!) and to challenge your understanding of the subject. They should spread light on the topics as well as the relationship of the material to physics if you take your role in the group activity seriously.

Learning Environment

- There must be a respectful exchange of ideas with instructor and other students in class.
- Engage in the discussion on Zoom with your camera on. (See policy on that later in the syllabus.)

Course Policies

Attendance: Important! Students who come to class learn more and do better on average than those who do not. You are responsible for information covered in class!

Bad Weather: If school is closed and our class is cancelled, we will continue with our schedule adjusted accordingly.

Incomplete Grades: Incompletes are given at the instructor's discretion. I will only consider an incomplete for verifiable unusual circumstances for students who have completed 80% of the course material. (A student should withdraw from the course in most other circumstances.) Grades of Y or WP will not be issued in this course.

Academic Dishonesty: Cases of academic dishonest, as defined the *Student Code of Conduct*, will be reported to the Dean of Student Services. First offenses will be given a zero on the affected assignment and reported to the Dean of Students. Second offenses will be reported for disciplinary action and the student will receive a failing grade in the course.

Late Work: You should submit your work on Moodle at the time it is due, even if it's incomplete! No late work is accepted. Plan to hand in what you have completed at the time the assignment is due for the credits on the parts of the assignment you have done. Better some credit than none!

Zoom Policy: In order to be most successful, students must engage actively in the course. Our course policy on zoom with include the following expectations:

- You attend class daily
- You turn your camera on (blur the background if needed) and use mute as needed.
- Speak up just as if we were in a classroom
- Students who need a day or two with a camera off must only chat with instructor ahead of time
- Students who consistently have camera off (instructor discretion) will be put in the waiting room unless we've discussed it ahead of time.

Syllabus Caveat: Any item not specifically covered in this syllabus shall be determined solely at the discretion of the course instructor. You agree to abide by the syllabus and the decisions of the instructor.

Course Evaluation

Homework: You will be asked to turn in approximately eight weekly homework assignments. Homework due dates will be posted with each assignment on the course website. Some assignments will be thoroughly graded and others may be spot checked.

Basic Standards of Submitted Work:

- Problem number labeled
- Work from any scratch paper is curated and submitted in a neat, tidy, legible write up.
- Logical work flow – think of someone following your work (focus details on course level material and ok to skip details of basic algebra, etc)
- **Any work not meeting these requirements will receive at most 6 out of 10. No exceptions.**

Activities: In an effort to focus on conceptual understanding of the calculus of vectors and to relate the study of vector calculus to the field of physics, students will complete nine group activities this term. **The activities are designed to increase your geometric understanding and reasoning**. You will be working in groups of 3 or 4, and group membership may change from time to time. Each group effort will have a fundamental question for you to ponder after the work and then something to submit individually. **This is the primary way that we will approach and assess course outcome #1.**

The highlighted note above in the homework section also applies to written work submitted after an activity.

Tests: We will have one mid-term exam and one cumulative final exam, both in-person. Testing dates will be announced in class. Tests are to be taken on the testing dates and any needs to test other than the scheduled dates must be given at least two days prior to the test. Make-up tests are given at the discretion of the instructor.

During exams, students are allowed one 3x5 notecard and a non-programmable calculator.

Grading

Your course grade will be determined by the number of points that you earn, and then distributed equally among the four major assignment categories shown here.

• Homework:	25%	90% - 100% A
• Activities:	25%	80% - 89% B
• One Midterm Exam	25%	70% - 79% C
• One Final Exam	25%	60% - 69% D
		< 60% F

Midterm Exam – Friday of Week #5 in-person at LBCC (location TBA)

Final Exam – See the school calendar of finals for our final time and date (in-person at LBCC)

Student Learning Outcomes

Upon completion of the course, the student will be able to

1. Develop a unifying thread throughout the major topics in the course starting with the vector differential.
2. Construct and evaluate line integrals and surface integrals.
3. Develop an analytic and geometric understanding of the gradient and of conservative vector fields, and their relationship to each other.
4. Develop an analytic and geometric understanding of curl and divergence, including their relationship to circulation and flux.
5. Develop an analytic and geometric understanding of the Divergence Theorem and of Stokes' Theorem.

LBCC COVID Statement

Wear a mask or face covering indoors at all times. Your mask or face covering must be properly worn (fully covering nose and mouth and tight-fitting). Mesh masks, face shields, or face covering that incorporates a valve designed to facilitate easy exhalation are not acceptable. If you have a medical condition or a disability that prevents you from wearing a mask or cloth face covering, you must obtain an accommodation from CFAR (Center for Accessibility Resources) to be exempt from this requirement. State guidelines do not limit class size. Physical distancing accomodations can be made upon request and cleaning supplies are also available for personal use.

LBCC Comprehensive Statement of Nondiscrimination

LBCC prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, marital status, disability, veteran status, age, or any other status protected under applicable federal, state, or local laws.
(for further information http://po.linnbenton.edu/BPsandARs/)

Disabilities Services Statement

Students who may need accommodations due to documented disabilities, who have medical information which the instructor should know, or who need special arrangements in an emergency, should speak with the instructor during the first week of class. If you have not accessed services and think you may need them, please contact Disability Services, 917-4789.

Statement of Inclusion

The LBCC community is enriched by diversity. Everyone has the right to think, learn, and work together in an environment of respect, tolerance, and goodwill. I actively support this right regardless of race, creed, color, personal opinion, gender, sexual orientation, or any of the countless other ways in which we are diverse. (related to Board Policy #1015)