Linn-Benton
Community College

Spring 2022 - MTH 254 Multivariable Calculus - 41831

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Office: WOH 117, Zoom link in Moodle

Class Times: MTWF 11-11:50p
Class Location: WOH 120
Drop-In Hours: T 12-1p, F 2-3p,
Zoom only R 10-11a

What you need for the class?
- Regular and reliable access to the internet (LBCC library technology resources can help)
- Ability to scan documents and create pdfs (free apps like CamScanner work fine)
- Achieve paid access (includes ebook, start with temporary free access)
- Optional: calculator without a symbolic manipulator for exams. (e.g TI-36X Pro, TI-84)
- at least 10 hours a week outside of class times to practice and learn the material

Course Description:
The fourth course in the calculus sequence for students majoring in mathematics, science and engineering. Topics include vectors in 2 and 3- space, graphs, contour maps and equations of multivariable functions and partial derivatives, directional derivatives, optimization of services, cylindrical and spherical coordinates, multiple integrals and their applications. Prerequisite: MTH 252 or equivalent with a grade of C or better.

What will you learn in this class?
- Demonstrate an understanding of vectors, vector operations, and apply vectors to solve application problems in 2D and 3D.
- Graph and write equations for functions in 3D.
- Apply limits and derivatives to multivariate functions.
- Apply integration techniques to multivariate functions.

How will your grade be calculated?
Your grade in this class will typically be calculated using a weighted average of the following:

5%....Previews
5%....In-Class Activities
15%...Online Homework
10%...Written Homework and Reflections
40%...2 Midterm Exams (20% each)
25%...Final Exam

Final Grade: 90%-100%=A, 80%-89%=B, 70%-79%=C, 60%-69%=D, <60%=F

How will the class work?
Mathematics is a combination of knowledge and skill, and like any skill can only be learned by *doing (e.g. you can't learn to juggle only by watching someone else juggle*). In order to prepare to learn you will preview material prior to class. We will frequently work on solving problems during class. You should also follow along during any lecture with paper and pencil to work out problems as you go and answer questions. Online homework is your opportunity to practice and

quiz yourself on the material with immediate feedback and multiple chances. Written homework will help you synthesize what you've practiced, solve more complex problems, and practice communicating your solutions. The corresponding written homework forums will ask you to reflect, make connections, and learn from mistakes. You will show what you have learned on two midterms and a Final.

The goal is to learn
All the assignments in the course have been chosen to help you learn, practice, and ultimately master the content.[1] While I encourage working with classmates, a tutor, etc., your goal is to make sure you fully understand the material discussed. Any work you turn in must be your personal understanding of multivariable calculus (not your classmates or the internets). You are personally responsible for any solution (online or written) you turn in and should be able to walk me through your process and understanding verbally if asked. *At the end of the term, I can adjust your grade to better reflect your personal understanding of the course material, if necessary.*

Lessons
Lessons will start with a preview assignment posted in Moodle that should be completed 2 hours before class (so I have a chance to take a look). During class we will often work problems or tackle ideas using 3D surfaces. Class activities cannot be made up since they involve surfaces and class conversations. The class will be recorded and posted to a Moodle Panopto block. Two preview grades and one activity grade will be dropped end of the term.

Online Homework and Practice
Following each lesson you will be given problems in Achieve for you to quiz yourself, make mistakes, and generally practice what you learned from the lesson. Mistakes are a necessary part of learning, so you will have ten attempts at each question with no penalty. In Achieve you can easily look up additional examples or explanations in corresponding sections in the book, and many of the problems contain hints or targeted feedback.

Although answers will be submitted online, you should write out your process by hand (*more than scratch paper*). This will give you practice writing out solutions, a place to start when asking for help, and give you a clear record of work to study for exams. When you come to office hours or other tutors for help, you should bring a copy of the problem and your notes for your attempt.

Written homework and reflections:
Weekly written homework will give you a chance to solve more complex problems and practice communicating your understanding clearly. Once completed, scanned and submitted in Moodle you will review solutions to discuss the mathematics, mistakes, connections, and questions in a weekly forum to gain a deeper understanding of the mathematics involved. Give yourself enough time to tackle these problems as they are intentionally challenging.

How will my learning be assessed?
There are two midterm exams that you will take in class and a Final that is comprehensive. The tentative dates for these exams are listed on the course calendar. The final exam is determined by LBCC and will be on Monday of Final's Week 10-11:50pm.

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[1] Bloom's Taxonomy Levels of Learning: 1) Remembering, 2) Understanding, 3) Applying, 4) Analyzing, 5) Evaluating, 6) Creating. Level 3 is a minimum requirement, levels 5 and 6 likely earn an A.

Missing Class and Late Work:
Please do NOT attend class if you are sick. Sign in via zoom to participate remotely. The class lessons will be recorded and class notes auto-update in Onenote. This class covers a LOT of content so be sure to allot yourself enough time to cover the material on your own. If you try and learn more than one day of material in the same day, you will find yourself swimming in new ideas, and the human brain can only retain so much information all at once.

In general work should be completed by the deadline. You can have two, no questions asked, 48 hour extensions on assignments if you email with the subject line "late pass". If you miss an online homework deadline, you can still earn up to 75% credit on remaining problems for up to seven days. In general, exams will not be accepted late (unless sick or an emergency).

Class resources:
This class has many resources to help you succeed.
- Whether you have questions about material, the course structure, or even other topics, I am available in my drop-in hours or by appointment.
- Your classmates are a great resource and studies have correlated academic social groups with success in learning mathematics. Discord is a place to ask questions, chat with classmates, and schedule study sessions.
- The Learning Center offers the Math Support Zoom and free one-on-one tutoring.
- Paul's Online Math Notes for Calculus 3 has additional examples, practice problems and solutions that are a great resource.
- The Achieve ebook has additional examples, exercises, and interactives that can give you alternate explanations and visualizations.

Expectations:
Expect to work at least 12-16 hours a week learning and practicing the material. Come prepared and ready to engage the class. This includes completing the preview, asking questions, participating in activities, and interacting with classmates. Students are responsible for any material or other information covered during class. We will cultivate a culture of respect in the class, in word as well as behavior. Along these lines, please turn your cell phone ringer off and postpone text conversations until after class. Students should also check their student email and regularly log into Moodle to complete homework.

Student Needs:
The Roadrunner Resource Center is available to help students who have difficulty affording groceries or lack a safe and stable place to live. RRC can also direct you to community resources to help with other issues getting in the way of your success (e.g. buying books, transportation, child care, part-time employment, etc.) Call 541-917-4877 or visit www.linnbenton.edu/rrc.

Special Circumstances:
Students who may need accommodations due to documented disabilities, or 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 think you may need accommodation services, please contact Center for Accessibility Resources, 917-4789.

Statement of Nondiscrimination:
LBCC maintains a policy of nondiscrimination and equal opportunity in employment and admissions, without regard to race, color, sex, marital and/or parental status, religion, national origin, age, mental or physical disability, or veteran status. The LBCC community is enriched by diversity.

Academic Honesty:
Academic integrity is the principle of engaging in scholarly activity with honesty and fairness, and participating ethically in the pursuit of learning. Academic integrity is expected of all learners at LBCC. Behavior that violates academic integrity policies at LBCC includes cheating, plagiarism, unauthorized assistance or supporting others in engaging in academic dishonesty, knowingly furnishing false information, or changing or misusing college documents, among others. LBCC students are responsible for understanding and abiding by the College's academic integrity policy.

If I become aware of academic misconduct, I will meet with the student(s) in question to discuss the matter and may assign a consequence of an "F" or "NP" for part of the assignment, the entire assignment, or the course overall. I will also report the matter to the Manager for Student Conduct and Retention, and the College may take further disciplinary action. When in doubt if something constitutes academic misconduct, please contact me and ask for clarification. The instructor reserves the right to request students verbally explain their work or understanding on any assignment if academic dishonesty is a concern.