Information Sheet for Math 224   Fall 2025

Class meets: MTWRF noon to 12:50 pm in CF 314

Credits: five credits

Teacher: Branko Ćurgus, Professor of Mathematics

Office: BH 184A

Office Hour: MTRF at 1 pm or by appointment (in person or see the class Canvas page for a Zoom link)

Email: curgus@wwu.edu

Course website: https://faculty.curgus.wwu.edu/Courses/224_202540/224.html

Texts: CALCULUS, Volume 3, OpenStax

Calculus Online Textbook, by Gilbert Strang

Material Covered In OpenStax textbook we will cover Sections 2.1, 2.2. 2.3. 2.4. 2.5, 1.1, 2.6, Chapter 4, and Chapter 5. In Calculus Online Textbook we will cover Sections 11.1, 11.2, 11.3, 12.1, 12.2, Chapter 13, and Chapter 14.

For each topic I will post a detailed syllabus with specific parts of the textbooks that we will study.

In Math 124 and 125 you studied differential and integral calculus of functions of a single variable. In this course we will study analogous concepts for functions of two and three variables.

Exams: There will be three in class exams and a comprehensive final exam. The dates for the in-class exams are Wednesday, October ??, Wednesday, November ??, Tuesday, November 25. The final exam is comprehensive. It is scheduled for *three hours* on Friday, December 12, 8 am - 11 am. There will be no make-up exams. If you are unable to take an exam for a very serious reason, please see me beforehand. This does not apply to the final exam which cannot be taken neither early nor late.

Homework: Suggested homework problems will be assigned on the class web site. Homework will not be collected. Questions about homework problems, or any other calculus related problems are welcome. I strongly encourage you to put your questions in writing with a description of your difficulty. You can hand in your questions at the beginning of each class period. I will give extra credit for well posed interesting questions.

Engagement and Activities: This portion of your grade is designed to reward your active and consistent engagement with the course material. It is based on two main components: **Homework Assignments** and your **Learning Activities**. Your Learning Activities will be assessed at the end of the quarter via an **Engagement Report**.

Homework Assignments: I will post several small, graded homework assignments on Canvas. You will submit your work as a PDF file through Canvas by the specified due date.

Learning Activities and Discussion: Your active participation is crucial for learning. You are encouraged to use the Canvas Discussions to post questions, share solutions to interesting problems, or discuss concepts that you find confusing. Engaging with your peers' posts is also highly valued.

Engagement Report: Before the final exam, you will submit a report summarizing your learning activities. In this report, you can highlight your participation in discussions, mention additional problems you solved, or describe other ways you engaged with the material. Undocumented claims will receive marginal credit.

Grade EA: Based on your graded homework scores and the engagement report, you will receive a single score from 0 to 100 for this category called EA . This score will be factored into your final grade as described in the **Grading** section.

Grading: Each exam will be graded by an integer between 0 and 100. Your final grade will be determined using the following formula

$$\texttt{FG} = \left\lceil 0.2 * \Big(\texttt{E1} + \texttt{E2} + \texttt{E3} + \texttt{EA} - \min\big\{\texttt{E1}, \texttt{E2}, \texttt{E3}, \texttt{EA}\big\}\Big) + 0.4 * \texttt{FE}\right\rceil,$$

where $\texttt{E1}$, $\texttt{E2}$, $\texttt{E3}$ are the grades for three in-class exams and $\texttt{FE}$ is the grade for the final exam. In the above formula the symbol $\lceil x \rceil$ denotes the ceiling of a real number x. Hence, $\texttt{FG}$ is an integer between 0 and 100. Your letter grade will be assigned according to the following table.

| F : 0 - 49 | D : 50 - 54 | C− : 55 - 59 | C : 60 - 64 | C+ : 65 - 69 |
| B− : 70 - 74 | B : 75 - 79 | B+ : 80 - 84 | A− : 85 - 89 | A : 90 - 100 |

Remarks: This is a fast-paced course. It consists of four parts, each being a foundation for the next. The first part deals with vectors and the vector algebra. The secong is geometric representations of functions of two variables and the geometry of three-dimensional space. The third part deals with differential calculus and its applications. The fourth part deals with integration. It is essential that you keep up with the material presented every day; do the homework problems; look for help if you encounter difficulties.

How to succeed: Attend class regularly and do all the suggested homework problems. Do more problems. (Ideally you should do all the problems in the book.) Read the book before class and before doing the problems. Keep organized notes of all your work. Make sure that you *fully understand* how to do each assigned problem correctly. Do not hesitate to ask a question whenever something is unclear. Our class Canvas page features a Discussions section, which is an excellent place to share questions with the class. Of course, you are also welcome to stop by my office hour and ask your questions in person. You can talk to other students from this class or other calculus classes, visit Math Center in BH 211A, stop by my office during the office hours or make an appointment. There are plenty of resources. Use them!

Student learning outcomes: By the end of this class, a successful student will demonstrate: (1) Understanding of vector algebra, including addition, scalar multiplication, dot and cross products, and the ability to use vector algebra to solve geometric problems; (2) Understanding how to use vectors to derive different forms of equations for lines and planes; (3) Understanding of, and the ability to use, functions of several variables, as described by formulas, graphs, contour diagrams or tables of values; (4) The ability to use contour diagrams and cross sections to draw graphs of functions of two variables; (5) Understanding of the algebraic and geometric properties of linear functions of several variables and the special role they play in study of functions of several variables; (6) Understanding of the concept of continuity of functions of several variables and the ability to determine whether a given function is continuous or not; (7) Understanding of the analytic and geometric ideas behind the definition of partial and directional derivatives and the gradient vector and the ability to perform calculations related to these concepts, including use of the chain rule; (8) The ability to use the concepts in the previous item to determine tangent planes to graphs and surfaces and to solve a variety of other problems related to functions of several variables; (9) The ability to set up and solve optimization problems for functions of several variables, including the use of Lagrange multipliers; (10) Understanding of the concept of the definite integral of a function of several variables and the ability to use these integrals in applications; (11) Understanding of Fubini's theorem, which is the main tool for calculation of multiple integrals, and the ability to use this theorem to calculate definite integrals of functions of two or three variables over regions in the plane or in the 3-space, and to do so in Cartesian, polar, cylindrical, and spherical coordinate system.

Academic Honesty Policy: Academic dishonesty is not tolerated at Western Washington University. Representing the work of another as one's own is an act of academic dishonesty. For a full description of the academic honesty policy and procedures at Western, see Appendix D in the University Catalog.

Flexibility Statement: This syllabus is subject to change. Changes, if any, will be announced in class or online. Students will be held responsible for all changes.

Sylabii@WWU: Please go to `https://syllabi.wwu.edu/` where you will find Syllabi Policies for Students and Campus Resources for Students

The Branko Ćurgus Mathematical Experience: Mathematics has always been a personal experience for me: **The Branko Ćurgus Mathematical Experience**. I want to create an environment where you can embrace mathematics as your own personal experience. How can this be achieved? Begin by acknowledging what you don't understand without fear. Discuss challenges openly with others. Open your mind, ask questions. Share your questions generously with others, treating them like precious gems. Questions are the gateway to deeper comprehension. Indeed, questions serve as a bridge from confusion to clarity.