Information Sheet for Math 224 Fall 2018

Class meets: MTWRF 9:00 - 9:50 a.m. in BH 227

Instructor: Branko Ćurgus **Office Hours:** BH 178 MTRF noon **Email:** curgus@wwu.edu

Course website: http://faculty.wwu.edu/curgus/Courses/224_201840/224.html

Text: Multivariable CALCULUS, 6th edition, McCallum, Hughes-Hallet, et al.

Material Covered We will cover Chapters 12, 13, 14, 15 and 16. For each chapter I will post a detailed syllabus. 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 17, Wednesday, November 7, Wednesday, November 28. The final exam is comprehensive. It is scheduled for *three hours* on Monday, December 10, 8am - 11am. There will be no make-up exams. If you are unable to take an exam for a very serious reason verified in writing, 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 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.

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

$$\texttt{FG} = \left\lceil \texttt{0.2*E1 + 0.2*E2 + 0.2*E3 + 0.4*FE} \right\rceil,$$

where `E1, E2, E3` are the grades for three in-class exams and `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, `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 three parts, each being a foundation for the next. The first part (Chapters 12, 13) deals with geometric representations of functions of two variables and the geometry of three-dimensional space. The second part deals with differential calculus and its applications (Chapters 14, 15). The third part deals with integration (Chapters 16). 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. 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, and the ability to use, functions of several variables, as described by formulas, graphs, contour diagrams or tables of values; (2) The ability to use contour diagrams and cross sections to draw graphs functions of two variables; (3) Understanding of the algebraic and geometric properties of linear multivariable functions and the special role they play in study of multivariable functions; (4) Understanding of the concept of continuity of functions of several variables and the ability to determine whether a given function is continuous or not; (5) Understanding of vector algebra, including addition, scalar multiplication, dot and cross products, and the ability to use vectors to solve geometric problems; (6) 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; (7) 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; (8) The ability to set up and solve optimization problems for functions of several variables, including the use of Lagrange multipliers; (9) Understanding of the concept of the definite integral of a function of several variables and the ability to use these integrals in applications; (10) Understanding of Fubini's theorem, which is the main tool for calculatinon 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, cylinrical, and spherical coordinate system.