

Marshall University – Course Syllabus

Course Title/Number	MTH 231 – Calculus and Analytic Geometry III – Section 202 - CRN: 4144
Semester/Year	Spring 2016
Days/Time	MTWR: 2:00 – 2:50 PM
Location	Smith Hall 511
Instructor	Dr. Ari Aluthge (Pronounced: A-luth-gay)
Prerequisites	MTH 230 (a grade of C or better)
Office	Smith Hall 714
Phone	(304) 696 3050
E-Mail	aluthge@marshall.edu
Office/Hours	M - F: 9:00 – 10:30 AM or by appointment
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment.

Course Description: Vectors, curves, and surfaces in space. Derivatives and integrals of functions of more than one variable. A study of the calculus of vector-valued functions. 4 hours.

Course Topics: Chapters 12 – 16 in the textbook

- Vector Geometry
- Calculus of Vector Valued Functions
- Multivariable Calculus – Differentiation
- Multivariable Calculus – Integration
- Line and Surface Integrals
- Fundamental Theorem of Vector Analysis (time permitting)

Course Learning Outcomes:		
Course Student Learning Outcomes	Students will practice each outcome in this Course	Student achievement of each outcome will be assessed by
Students will have an understanding of the fundamental concepts of calculus and an appreciation of its many applications.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.
Develop critical thinking skills by asking students to convert real-world problems into forms suitable for calculus, and interpret the results of calculus in real-world problems.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.
A deeper understanding of the mathematics that is used in their science and engineering courses.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.
Students will develop facility in using graphing calculators to solve mathematics problems.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.
<i>Reasoning:</i> Calculus is a collection of reasoning techniques that allows one to understand how changing quantities behave. This understanding is fundamental to progress in science and engineering. Students will use mathematical reasoning in their study of calculus concepts to verify properties of the concepts they study, and they will use scientific reasoning to determine whether possible solutions are reasonable for a given situation.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.

<i>Representations:</i> Students will work with information specified in verbal, graphical, tabular, and symbolic forms. Many problems will require students to take information in one of these forms, analyze it, and create a solution in a different form. Students will be required to produce verbal explanations of the meanings of mathematical concepts, both in general and in the context of specific problems.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.
<i>Information literacy:</i> To solve the applied problems in this course, students must determine which information in the problem is relevant to the solution, access this information and use it to obtain a mathematical solution, and then translate the mathematical solution back into the language of the original problem.	Class lectures and discussion, and exercises or worksheets.	Homework, projects, tests, and class participation.

MUonline: Information about the course such as syllabus, assignment schedules, and your grades will be posted on Blackboard. Students should log in to MUonline on a regular basis to check their assignments schedule and grades.

Required Texts, Additional Reading, and Other Materials:

1. Calculus, 3rd Edition, by Rogawski (and Adams), W.H. Freeman, 2015, ISBN: 9781464114885
2. A graphing Calculator (TI-83 plus is recommended). Calculators will not be allowed on some exams.
3. Computer access

Course Requirements / Due Dates

1. Weekly WebWork (online) homework assignments due by each Sunday midnight, starting January 22.
(Go to <http://webwork.marshall.edu/webwork2> and click on “S17 –Math-231-Aluthge” and log on with your usual Marshall username and password.)
2. Tests on Feb 6, Mar 9, April 10, and the Final Exam (Comprehensive) on Monday, May 1 (12:45 – 2:45)
3. Worksheets collected on most Thursdays starting January 19.
4. Daily attendance and class participation.

Grading Policy

Grade will be based on:

- Ten Weekly worksheets to be collected on most Thursdays, starting Jan 19 = (145 points – Mostly 15 points each)
- Ten WebWork assignments – 150 points (each assignment has 16 questions – it is possible to earn 160 points)
- Four written exams – 450 points (Each test -100 points, Comprehensive Final Exam - 150 points)
- Daily attendance - 55 points (1 point per each day – so it is possible to earn 59 points)
- Total Possible Points = 800
- Latter Grades Scale: A = [720, 800], B = [640, 720), C = [560, 640), D = [480, 560), F = [0, 480).

Attendance Policy

Daily attendance will be taken (1 point for each day). When a student is absent from class, he/she is responsible for any and all material covered or assigned. Make-up exams will be given only if the student has an excused absence. Excused absences must be approved by the office of the dean of students.

Class Assignments:

1. Ten Weekly WebWork homework assignments due by 11:59 PM on each Sunday.
2. Worksheets collected on Thursdays.
3. Three tests during the semester (on Feb 6, Mar 9, April 10)
4. Final Exam (comprehensive) on May 1 (12:45 – 2:45)

About WebWork: WebWork is a learning management system (LMS) similar to Blackboard. Students can log onto WebWork by going to <http://webwork.marshall.edu/webwork2> and the clicking on S17-Math-231-Aluthge. Students will use their Marshall username /password. Students will find their homework assignments there. They should start with the assignment “Orientation” to learn basics of the program, especially how to type mathematical expressions.

Cell Phone Policy: Please turn off your cell phone or at least put it in silent mode before entering the class.

Tentative Class Schedule:

Week of	Coverage (book sections)	Topics
Week #1 (1/9 – 1/13)	12.1 – 12.3	Vectors in plane (\mathbb{R}^2) and three dimensional space (\mathbb{R}^3)
Week #2 (1/16 – 1/20)	12.3 – 12.5	Dot product, cross product, planes in the space.
Week #3 (1/23 – 1/27)	12.5 – 12.7	Quadratic surfaces, cylindrical and spherical coordinates.
Week #4 (1/30 – 2/3)	13.1 – 13.2, Review	Vector valued functions, Review,
Week #5 (2/6 – 2/10)	Test 1, 13.3 – 13.4	Test 1 (on Cha 12, 13.1-13.2), Arc length and speed, Curvature
Week #6 (2/13 – 2/17)	13.4 – 14.1	Curvature, Motion in space, Functions of two or more variables
Week #7 (2/20 – 2/24)	14.2 – 14.4	Limits and continuity, Partial derivatives, Differentiability
Week #8 (2/27 – 3/3)	14.4 – 14.6	Differentiability/Tangent planes, Gradient/Directional Derivatives, The chain rule,
Week #9 (3/6 – 3/10)	14.7, Review, Test 2	Optimization, Review, Test 2 (13.3 – 1.3.5, Cha 14)
Week #10 (3/13 – 3/17)	15.1 – 15.2	Double integrals
Week #11 (3/20 – 3/24)	Spring Break	No classes
Week #12 (3/27 – 3/31)	15.3 – 15.4, Skip 15.5	Triple integrals, integration in polar, cylindrical, and spherical coordinates
Week #13 (4/3 – 4/7)	15.4 – 15.6, Review	Finish 15.4, Change of variables, Review
Week #14 (4/10 – 4/14)	Test 3, 16.1 – 16.2	Test 3 on Cha 15, Vector fields , Line integrals
Week #15 (4/17 – 4/21)	16.2 – 16.4	Parameterized surfaces, surface integrals of vector fields.
Week #16 (4/24 – 4/28)	16.5 – 16.5, Review	Finish Cha 16, Green's theorem (time permitting), Review for the final exam
Week #17 (5/1 – 5/5)	Final Exam (Comprehensive)	Final exam on Monday, May 1, 12:45 – 2:45

Tentative WebWork assignments schedule Schedule:

Each assignment contains 16 questions from the material indicated sections. Each question is 1 point worth. So students have a chance to an extra point on each WW assignment. For most questions, students have up to

WW #	Sections covered	Opens at 12 AM on	Closes at 11:59 PM on
1	12.1 – 12.2	January 07	January 22
2	12.3 – 12.4	January 14	January 29
3	12.5 – 12.7	January 21	February 5
4	13.1 – 13.2	January 28	February 19
5	13.3 – 13.5	February 04	February 26
6	14.1 – 14.2	February 11	March 5
7	14.3 – 14.4	February 18	March 19
8	14.5 – 14.6	March 04	April 9
9	15.1 – 15.2	March 11	April 16
10	15.3 – 15.4	March 18	April 30