

Multivariable Calculus Syllabus

Instructor: Dr. Chuck Garner

Text:

Kaplan, Wilfred. *Advanced Calculus*, 5th ed., Addison-Wesley, 2005. ISBN 0201799375; \$111.40

Additional Resource:

The *Visual Calculus* Web Page: <http://archives.math.utk.edu/visual.calculus>

Course Description: This course is designed to provide a college-level experience in mathematics. Students will use and understand fundamentals of linear algebra. Students will be able to work with multivariable functions and understand the concepts of limits, derivatives, and integrals as applied to those functions. In particular, students will use partial derivatives, multiple integrals, and line integrals. Students will also use a vector interpretation of multivariable functions and apply the notions of the gradient, the divergence, and the curl to real-world phenomena. Students will also be introduced to the calculus of complex variable functions. During the month of May, students will be introduced to the theory of differential equations.

Grades are confidential and will only be discussed with the concerned student and the student's parents.

Evaluation:

FIRST SEMESTER.		SECOND SEMESTER.	
2 Tests, each 45 pts	90	2 Tests, each 45 pts	90
1 Mid-Term	75	1 Mid-Term	75
30 Homeworks (drop 3), each 5 pts	135	30 Homeworks (drop 3), each 5 pts	135
TOTALS:	300		300

There are no make-up tests or homeworks; the lowest 3 homeworks will be dropped at the end of the semester. If a test is missed first semester, the exam will be used to replace the missing test. Second semester includes three test grades: 2 calculus tests and the AMC. Exactly one-half of your AMC score is entered as a test grade. The lowest of the two calculus tests and the scaled AMC score will be dropped.

As always, the Final Average is 80% of the above grades plus 20% of the exam grade.

Students are required to keep track of their own grades. You may compare your grade calculations with me after school; I will not discuss grades during the school day.

Tentative test dates: *First Semester* – Test 1, August 26; Mid-Term Exam, September 24; Test 2, November 9; Final Exam, December 17. *Second Semester* – AMC, February 9; Test 3, February 10; Mid-Term Exam, March 22; Final Exam, April 28; Differential Equations Test, May 24.

Cheating of any kind on any assignment will result in zero points for that assignment for all persons involved and possibly a grade of "F" for the course.

This syllabus provides a general plan for the course; deviations may be necessary.

Multivariable Calculus Homework Assignments Listed by Day

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|---|---|--|
| 1: Page 15, #1 parts a–d, #2 | 23: Page 121, #1 parts a and b, #2, #3 | 38: Page 241, #1 parts a and b (part c is extra credit), #4 parts a, b, and c |
| 2: Page 16, #5, #6, parts a, b, and c, #7, parts a and b | 24: Page 128, #8 parts a, b, and c; Page 129, #10 parts a and d, #11 part c, #15 part a | 39: Page 248, #2 part b, #3; Page 249 #9 (#2 part a is extra credit) |
| 3: Page 16, #4, #10 | 25: Page 134, #1 parts a, b, c, and d | 40: Page 252, #1; Page 253 #4 parts b and c |
| 4: Page 17, #3, #13 parts c and d; Page 20, #2 (change directions: identify which are not meaningful); Page 21, #3 part a, #4 part a, #5 part c | 26: Page 143, #1 part c, #2 part b, #3 parts a and b, #4 part b (#4 part a is extra credit) | 41: Page 256, #1 parts a, b, and c, #2 parts a, b, and c, #4 part a |
| 5: Page 25, #1 (change directions: identify which are not meaningful); Page 26, #4 part a, #6 (#8 extra credit) | 27: Page 158, #4 parts b, c, d, and g; Page 159 #5 parts a, b, and e | 42: Page 278, #1, #2 parts a and b; Page 279 #3 parts a and c |
| 6: Pages 30-31, #2 parts c, f, h, and j; #3 parts b and c; #4 part a; #8 parts c and d | 28: Page 159, #6 parts a, b, and c, #8 part b | 43: Page 279, #3 part b, #4 |
| 7: Page 34, #3 parts a and b, #5 parts a and b, #6 part a | 29: Page 159, #9 | 44: Page 286, #1 |
| 8: Page 38, #1, #2 part a, #4 parts c and d | 30: Page 180, #1 part c, #2 parts a and b, #3 parts a and b, and #5 | 45: Page 287, #5 parts a, b, c, d, e, and h |
| 9: Page 38, #6 part a, #7; Page 39, #8 | 31: Page 185, #5 part a; Page 186, #12 parts a and b | 46: Page 300, #1 |
| 10: Page 44, #1, #2, #5 part b, #8 | 32: Page 185, #6; Page 186, #11 parts b, c, and d | 47: Page 300, #2 parts b and d, Page 301 #3 parts b and d, #4, #6 part a, #7 |
| 11: Page 44, #3 | 33: Page 219, #1 parts b, c, and d, #2 parts a and d, #3 parts b and c; Page 220, #6 part a, and: Find the error bound in using the trapezoid rule to approximate $\int_{-1}^2 (x^3 - 2x^2 + 3) dx$ using 6 subintervals. | 48: Page 312, #1 parts a, b, d, and e |
| 12: Page 53, #1, #5 part a | 34: Page 223, #1 part b—and find a cubic approximation for the antiderivative; Page 224, #3 parts a and b, #4, (#8 is extra credit) | 49: Page 313, #5 parts a, b, and d, #6 part b, #7 part a |
| 13: Page 60, #1, #3, #8 | 35: Page 234, #1 part a, #2 | 50: Page 319, #1 parts a, b, c, and d |
| 14: None | 36: Page 235, #1 part c, #3 part a, #5; Verify \bar{y} and I_y | 51: Page 330, #1 |
| 15: Page 82, #2 | 37: Page 234, #1 part b—approximate final intergal numerically; Page 235, #4 part a; Page 236, #10 | 52: Page 330, #2 and: Which of the following are independent of path: page 312 #1 a, b, d, e, Page 330 #1 a, b ? |
| 16: Page 82, #4, #5, #6 | | 53: Page 536, #2 parts f and g, #3 part a |
| 17: Page 89, #1, #3 | | 54: Page 536, #4, #5, #7 |
| 18: Page 89, #4; Page 90, #5 | | 55: Page 540, #1, #2, #3 |
| 19: Page 95, #1 parts c, d, e, f, g, #2 parts a, b, and c | | 56: Page 544 #1, #2 parts a and b, #3 part c |
| 20: Page 100, #2, #4, and #10 | | |
| 21: Page 104, #1 parts a, b, and c; Page 105, #2 part a, #5 | | |
| 22: Page 116, #1, #3 parts a and c (Page 117, #7 is extra credit) | | |