
Magnet Calculus II

Survival Guide

Magnet Calculus II Syllabus

Instructor: Dr. Chuck Garner

Office Hours: I have Math Team on Tuesdays and Thursdays after school and on Friday mornings before school. All other times before or after school are available, but you must give me 24 hours notice.

Text:

Chuck Garner, *Calculus: Dynamic Mathematics Volume Two*. First edition, RMMT Publishing, 2011. \$40.00

Additional Resources:

1. George B. Thomas, Ross L. Finney, Maurice D. Weir, and Frank R. Giordano. *Thomas' Calculus, Early Transcendentals Part One: Single Variable*, Updated 10th edition, Addison-Wesley, 2003. ISBN 0321123565. \$146.00
2. Wilfred Kaplan. *Advanced Calculus*, 5th ed., Addison-Wesley, 2005. ISBN 0201799375; \$86.67
3. The *Visual Calculus* Web Page:
<http://archives.math.utk.edu/visual.calculus>

Course Description: This course—the second of a two-year sequence—is designed to provide a college-level experience in mathematics. Students will model motion using vectors and parametric equations. Students will understand the calculus of polar curves and functions. Students will use and understand fundamentals of linear algebra including eigenvalues and eigenvectors. Students will use convergence tests to determine convergence of infinite series, including Taylor series. 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 apply linear algebra, partial differentiation and series to solving differential equations.

Materials. *You will need the following materials on a daily basis.*

1. a notebook for notes
2. a binder with loose-leaf paper for homework
3. pencils (if you want it graded do it in pencil)
4. a graphing calculator
5. your textbook

Evaluation:

| <i>First Semester.</i> | | <i>Second Semester.</i> | |
|------------------------|------------|-------------------------------|-------------|
| 7 Modeling Motion | 240 | 10 Line and Surface Integrals | 250 |
| 8 Linear Algebra | 280 | 11 Infinite Series | 280 |
| 9 Partial Derivatives | 310 | 12 Differential Equations | 70 |
| 10 Multiple Integrals | 70 | AP Exam Preparation | 200 |
| | | Project | 200 |
| TOTALS: | 900 | | 1000 |

The following formula is used to determine your grade in this class each Semester:

$$\frac{\text{Total points earned}}{\text{Total points possible}}$$

As always, the Final Grade for each semester is computed by

$$\text{Final grade} = 0.8(\text{Semester grade}) + 0.2(\text{Exam Grade})$$

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

Make-Up Work:

Tests No make-up tests will be given unless arrangements are made prior to test day. If a test is missed either semester, that semester's final exam will be used to replace the missed test. There are no exam exemptions.

Quizzes No make-up quizzes will be given.

Homework No make-up homework assignments will be given, although late homework is accepted with a penalty: Late homework will be accepted up to seven calendar days late, for a three-point the first day missed, and a one-point penalty for each day subsequent day missed.

Absences Since tests and quizzes cannot be made-up, it is completely irrelevant whether the student's absence is excused or unexcused. It is entirely the student's responsibility to obtain notes, handouts, assignments, and any other information when the student is absent.

Cheating of any kind on any assignment is considered the theft of someone else's diligence 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.

Schedule First Semester

| Day | Assignment | | |
|-----|-----------------|----|-----------------|
| 1 | 7.1 | 18 | 9.1 |
| 2 | 7.2 | 19 | 9.2 |
| 3 | 7.3, Quiz | 20 | 9.3, Quiz |
| 4 | 7.4 | 21 | 9.4 |
| 5 | 7.5 | 22 | 9.5, EPS 8 due |
| 6 | 7.6 (Rev), Quiz | 23 | 9.6, Quiz |
| 7 | 7.6 (Prep) | 24 | 9.7 |
| | Chapter 7 Test | 25 | 9.8 |
| 8 | 8.1 | 26 | 9.9, Quiz |
| 9 | 8.2 | 27 | 9.10 |
| 10 | 8.3, Quiz | 28 | 9.11(Rev) |
| 11 | 8.4, EPS 7 due | 29 | 9.11 (Prep) |
| 12 | 8.5 | | Chapter 9 Test |
| 13 | 8.6, Quiz | 30 | 10.1 |
| 14 | 8.7 | 31 | 10.2 |
| 15 | 8.8 | 32 | 10.3, Quiz |
| 16 | 8.9 (Rev), Quiz | 33 | 10.4 |
| 17 | 8.9 (Prep) | 34 | 10.5 |
| | Chapter 8 Test | 35 | 10.6, EPS 9 due |

Schedule Second Semester

Day Assignment

| | | | |
|----|------------------|----|--|
| 37 | 10.7 | 50 | 11.6, Quiz |
| 38 | 10.8 | 51 | 11.7 |
| 39 | 10.9, Quiz | 52 | 11.8 |
| 40 | 10.10 | 53 | 11.9 (Rev), Quiz |
| 41 | 10.11 | 54 | 11.9 (Prep) |
| 42 | 10.12, Quiz | | Chapter 11 Test |
| 43 | 10.13 (Rev) | 55 | 12.1 |
| 44 | 10.13 (Prep) | 56 | 12.2 |
| | Chapter 10 Test | 57 | 12.3, Quiz |
| 45 | 11.1 | 58 | 12.4, EPS 11 due |
| 46 | 11.2 | 59 | 12.5 |
| 47 | 11.3, Quiz | 60 | AP review begins; Project Due May 8; AP Calculus BC Exam May 9 |
| 48 | 11.4 | | |
| 49 | 11.5, EPS 10 due | | |

How To Succeed in This Class

This class will be run differently from last year in that it will be more like a college-level math class than before. Last year the emphasis was on skill and application over theory and proof. This year the emphasis is reversed. The following describes other differences.

CLASSWORK

Everyone must have a notebook that will be devoted exclusively to classwork for this class. Don't worry about filling it up; we will.¹ You must always bring this notebook to class, along with a pencil and a graphing calculator. When class begins, your notebook, pencil, and calculator should be on the table, ready for action. Nothing else should be on your table while you are in this class, not even the previous homework. Sometimes you will copy what I write on the board; sometimes you will work problems alone; sometimes you will work in groups. Whatever we do, however, you will keep a record of it in the notebook.

Your notebook will not be collected, but you are allowed to submit your notebook as evidence towards a possible increase in test grade.

HOMEWORK

There will be a short homework assignment almost every night. You must do mathematics in order to understand it, so doing these assignments is essential. Homework is still out of 10 points, but I will be grading all homework. So you will no longer receive extra points for grading homework. However, you will be given the opportunity to have your poor homework grades erased under certain circumstances (see TESTS).

EXTENSION PROBLEM SETS

The Extension Problem Set format and grading has not changed.

TESTS

My intent on tests is to find out what you know and to get you ready for the format and style of the AP Exam. Not all tests will be in the AP format, since you are familiar with it from last year. The biggest change is that the tests will not be curved. Yes, that is correct, there is no "class average."

Tests will generally consist of 10 to 15 problems in which you must show all your work. There will be no multiple-choice problems on the tests. Tests will be out of 100 raw points with no curve.

But as a reward for good test scores, any chapter test grade of an A will have all homework and quiz grades erased for that chapter as if they never happened. So if you do not like doing homework, but are confident that you will do well on the tests, this will save you time and effort. Or you do not have to submit the homework you actually do for a grade. This also means you can use the quizzes as practice for the test without it affecting your grade. Please know, however, that all grades will be recorded (even the zeros) and in the gradebook until the test is graded. With a score of 90 or above on the test, all homework and test grades (even the good ones) will turn to "exempt."

You must be wise about this decision: Do you do homework or not? Should you gamble your grade on a test? That is something you will have to decide.

¹Homework should be done on paper from another source.

QUIZZES

Quizzes will no longer be partner quizzes, but they will be shorter and will only be worth 10 points instead of 20. Quiz problems will reflect homework problems in style and content.

THE PROJECT

Due during second semester is a project. The details of the project will be given just before Spring Break, and it will be due the day before the AP Exam.

EXPECTATIONS

Enough about assessment. Now a few brief words about behavior and general expectations.

I can teach you this material. You, however, have to give me the chance to teach it to you. For that reason, your involvement in the class must be total and undivided, and I want you to pin me down with questions when you are confused. If you are not paying attention, you are hurting yourself. If you are distracting others, you are hurting them. If you are distracting me, then you are hurting everybody. Think carefully about the effect you have on the learning of others.

If you ever find yourself falling behind, get extra help! It does not even have to be help from me. *Find a classmate and work together!* If neither one of you can understand something, then you can *both* come to me and we'll help twice as many people.

Don't be absent. It's much easier to be here than to catch up after you have not been here. If you do get sick, leave space in your notebook for each day missed and fill in the gaps when you return.