

Calculus A & B

2011-2012

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Course Description and Primary Objectives

Advanced Mathematics is offered to seniors at Midland Classical Academy as an elective alongside Advanced Fine Arts, Astronomy, and Senior Seminar. The course is designed to prepare students for higher level mathematics which they will encounter in college if they choose to pursue a math or science degree. Many college honor programs (English, Business, Nursing, etc.) also require an upper-level math course like calculus in their curriculum. The course will consist of approximately the first semester of college Calculus. It will involve a brief review of Advanced Algebra, but in no way is intended as a remedial course. The student will quickly be introduced to the subjects of limits, derivatives and integrals in order to solve advanced problems in science.

Grading

As in all MCA classes, *Mastery (M)* will require a total in *excess* of 85% of the total points for the class. *Mastery With Honors (MH)* (MQ for fall semester) will be achieved by the student achieving above 92.5% of these total points and by completing a service-oriented class project sometime in the course of the year. Students may initiate their own project idea or build upon suggestions offered by the tutors or classroom assistants.

The student will be required to steward their own work according to a syllabus that will be provided to students on the first day of class. It is the student's responsibility to refer to the syllabus, prepare for each upcoming class period and to stay advised on syllabus revisions. The syllabus provides:

- 1) the schedule of reading assignments from the textbook
- 2) the assigned homework problems for which the student is responsible
- 3) a schedule to memorize 2 Timothy if the student desires (see below)

As a senior level class, Calculus is graded differently than other typical classes at MCA. Students are expected to do as many of the homework problems as necessary in order to understand each assignment. This may mean doing every problem or it may mean doing every fourth problem or it may mean simply looking at the examples in the book and understanding them. In any case, ***no homework is ever collected or graded in this class!***

Class Participation Grade (30%) : Each period either a short class-wide quiz or an individual presentation decided by dice roll will test a student's daily understanding of the homework. The quizzes and dice-roll problems will generally be taken directly from the homework. The cumulative score from all of these in-class quizzes and presentations will determine the student's class participation score. If a student desires to raise this class participation score,

they may memorize and recite to the tutor the four chapters of 2 Timothy sometime during the year. Each chapter memorized will significantly improve the student's participation score if it is memorized without mistakes. This option is totally voluntary. Many students have opted not to memorize, and therefore have based their participation score for the class solely on their grades from the quizzes and dice-roll problems.

Project Grade (70%): Each student's project grade in the course is determined solely by their grades and revisions on tests. There are approximately 5 tests each semester.

Quiz and Test Revisions: Quizzes, since they reflect class participation, may not be revised. Tests may be revised if the initial score exceeds 70%. A student is never required to revise anything. Corrected tests will receive 70% of the points lost and may be turned in anytime before a fixed deadline communicated clearly on the syllabus. There are four windows in which to do revisions. A student must turn in revisions before these revision deadlines or the revision points will not be counted. For example, a deadline immediately after the Thanksgiving holiday is for all assignments through Test 3. Any revisions done on tests between the first of the year and Test 3 must be completed and turned in prior to the after-Thanksgiving deadline or they will not be accepted. As stated, there are four of these deadlines creating four windows of opportunity for revision points. Additionally, point deductions may be taken for late assignments. Late point losses may not be made up. If a student does not achieve a score of 70% or higher on a test, no revision points are entered into the grade book until the following process occurs:

1. The student must revise the test and arrange for a time to sit down one-on-one with the tutor to go over these revisions to ensure understanding. The second test will be given only after this process has occurred. The student must initiate this one-on-one tutoring session at the tutor's convenience.
2. At the tutor's discretion, if sufficient understanding cannot be demonstrated, the student may be required to revise certain homework problems that are creating difficulty, then review these problems as well as the test revisions with the tutor in a one-on-one session at the tutor's convenience.
3. The student must pass a second (usually more difficult!) version of the test with a score of greater than 70% or the process repeats.
4. On the last retaken test, no revision points will be allowed.

If the student never retakes the test, their initial score will stand. From this process, it should be obvious to the student that it is **MUCH** easier to understand a problem the first time it is turned in for homework, study all their homework problems prior to taking the first test, and ***pass the test the first time*** with a score above 70% so that they can freely revise for an even higher score. If this is not done, the student usually falls so far behind the general class that it becomes difficult to pass the course with a grade of 85%.

Extra Credit Assignments and Special Projects: Additional points may be earned through the completion of extra credit assignment or special projects. These will require a special request to the tutor and may differ according to student. Assignments may involve additional homework, research or an in-class presentation. Special projects will allow the students to explore an area of interest more deeply with the purpose of sharing or demonstrating insights to the rest of the class.

Class Time

Class time will be spent discussing concepts dealt with in the textbook that students have read before class. Class time will also focus on working practical problems to reinforce the concepts addressed in the text. Students are encouraged to work together to understand homework problems, but all students are expected to do their own work. Calculus should roughly require 4-5 hours per week of outside preparation time.

List of Books

The main textbook for the class will be:

Calculus With Analytic Geometry, Fifth Edition by Earl W. Swokowski.

Excerpts from the following textbooks will also be used:

Calculus, One and Several Variables by Robert Ellis and Denny Gulick.

Calculus by Howard E. Campbell and Paul F. Dierker.

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Tutor Hours

If a student requires help with their homework or in studying for a test, they should take advantage of office hours to get help. Regular office hours between classes will be posted on Mrs. Lybrand's and Mr. Russell's door.

Parents and students are invited to communicate with the tutors frequently via phone, E-mail, office visit or lunch.

Assignment for the First Day of Class

The student is asked to complete the first assignment from the attached syllabus and be ready for a quiz over this material on the first day of class.

Additionally, a packet of handouts pertaining to the first test are provided with this course description. Students will benefit by working as far toward the first test as possible before the first day of class.

The student is required to place a book cover on the textbook for the first day of class. Class participation points will be deducted for each day the textbook remains uncovered.