

Syllabus

Calculus

by W. David McRae

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|------------------|----------|-----------|------------------|
| Grades Level: | 12 | | |
| Length Option 1: | 36 weeks | (1 credit | Non AP Calculus) |
| Length Option 2: | 36 weeks | (1 credit | AB Calculus) |
| Length Option 3: | 36 weeks | (1 credit | BC Calculus) |

Analysis of Functions

Limits

Differentiation

Review of Limits and Differentiation

Applications of Differentiation (Implicit and Related Rates)

Applications of Differentiation (Extreme Calculus)

Introduction to Integration

Numerical Integration and Introduction to Transcendental Functions

Calculus of Transcendental Functions

Applications of Integration

More Integration Techniques*

Parametric and Polar Functions*

Series*

Preparation for the AP Exam

*BC Calculus only.

Prerequisites

Algebra I, Algebra II, Geometry, Trigonometry, PreCalculus

BC Students: PreCalculus Honors with an Introduction to Calculus (Units 1 – 3)

Requirements

1. Students must attend class regularly!
2. Students must make a valiant attempt to complete all homework assignments.
3. Students must complete all quizzes, test, and trimester exams.
4. Students must work independently and in cooperative groups. Be respectful, polite and encouraging to fellow peers.
5. Participate in class discussions and volunteer for board work.
6. Students must bring a TI-83 graphics calculator to class everyday.
7. Students should conduct themselves in a professional manner and follow the policies and guidelines of the school.
8. Student will take the Advanced Placement Exam at the conclusion of the course.

Evaluation

- A. Successful trimester grades will require a 70% or better average in each of the components listed below.
 - i. Unit Tests
 - ii. Daily Grade (Homework Check, Graded Homework and Quizzes)
- B. Marking period grade: There are typically two or three unit tests in each marking period. The daily grade is counted as half of a unit test.
- C. Marking Period Average = $(\text{Test}_1 + \text{Test}_2 + 0.5 \cdot \text{Daily Grade}) / 2.5$
- D. The Daily Grade is calculated as a percentage of the total possible points earned on the following assessments:
 - i. Daily check of homework (20 points minus 4 points for any missing assignment)
 - ii. Graded Homework (typically AP problems – 10 points each)
 - iii. Quizzes (15 minutes in length – 10 points each)
- E. At the end of the Fall and Winter trimester is a trimester exam. This exam counts as 25% of the trimester grade. The remaining 75% is split equally between the two marking period grades that make up the trimester. There is no final exam as the AP serves this purpose. I know of many schools that will use the free response questions which are released 48 hours after the AP as a final exam.
- F. Scale: I tend to be very picky and strict in the grading as well as give challenging assignments and test. Thus I have found it fair to use a slightly softer scale than the traditional 10 point scale. (NC= No credit or Failing)

| | | |
|-----|----|----|
| 0 | 49 | NC |
| 50 | 64 | D |
| 65 | 69 | C- |
| 70 | 73 | C |
| 74 | 75 | C+ |
| 76 | 78 | B- |
| 79 | 83 | B |
| 84 | 85 | B+ |
| 87 | 90 | A- |
| 91 | 99 | A |
| 100 | | A+ |

Grading: Homework, Quizzes and Exams:

I check homework virtually every day. This is a debatable policy for students at this level. I simply record a check mark in my grade book if it appears that a student has made a valiant effort toward the work (very subjective). Checking the entire class should take no more than five minutes. A student begins the marking period with 20 homework points and loses four points for any assignment missing. I accept late ungraded homework without any penalty. Each fifteen minute quiz or graded homework problem (typically an AP free response question) is worth 10 points. These are penalized if not completed on time. Each step of a problem should earn a point. In most integrals one point is for the limits and one point for the integrand.

Approximate Sequence of Topics

| Unit-1 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Prerequisite |
| Lesson 2 | Yes (2days) | Yes | Prerequisite |
| Lesson 3 | Yes (2days) | Yes | Prerequisite |
| Lesson 4 | Yes (2days) | Yes | Prerequisite |
| Lesson 5 | Yes (2days) | Yes | Prerequisite |
| Lesson 6 | Yes (2days) | Yes | Prerequisite |
| Lesson 7 | Yes (2days) | Yes | Prerequisite |
| Lesson 8 | Yes (2days) | Yes | Prerequisite |
| Lesson 9 | Yes | Yes | Prerequisite |
| Lesson 10 | Yes | Yes | Prerequisite |
| Total | 18 | 10 | 0 |

| Unit-2 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Prerequisite |
| Lesson 2 | Yes (2days) | Yes | Prerequisite |
| Lesson 3 | Yes (2days) | Yes | Prerequisite |
| Lesson 4 | Yes (2days) | Yes | Prerequisite |
| Lesson 5 | Yes (2days) | Yes | Prerequisite |
| Lesson 6 | Yes (2days) | Yes | Prerequisite |
| Lesson 7 | Yes (2days) | Yes | Prerequisite |
| Lesson 8 | Yes (2days) | Yes | Prerequisite |
| Lesson 9 | Yes (2days) | Yes | Prerequisite |
| Lesson 10 | Yes (2days) | Yes | Prerequisite |
| Lesson 11 | Yes | Yes | Prerequisite |
| Lesson 12 | Yes | Yes | Prerequisite |
| Total | 22 | 12 | 0 |

| Unit-3 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Prerequisite |
| Lesson 2 | Yes (2days) | Yes | Prerequisite |
| Lesson 3 | Yes (2days) | Yes | Prerequisite |
| Lesson 4 | Yes (2days) | Yes | Prerequisite |
| Lesson 5 | Yes (2days) | Yes | Prerequisite |
| Lesson 6 | Yes (2days) | Yes | Prerequisite |
| Lesson 7 | Yes (2days) | Yes | Prerequisite |
| Lesson 8 | Yes (2days) | Yes | Prerequisite |
| Lesson 9 | Yes (2days) | Yes | Prerequisite |
| Lesson 10 | Yes (2days) | Yes | Prerequisite |
| Lesson 11 | Yes (2days) | Yes | Prerequisite |
| Lesson 12 | Yes (2days) | Yes | Prerequisite |
| Lesson 13 | Yes | Yes | Prerequisite |
| Lesson 14 | Yes | Yes | Prerequisite |
| Total | 26 | 14 | 0 |

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| Unit-4 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | No | No | Yes |
| Lesson 2 | No | No | Yes |
| Lesson 3 | No | No | Yes |
| Lesson 4 | No | No | Yes |
| Lesson 5 | No | No | Yes |
| Lesson 6 | No | No | Yes |
| Lesson 7 | No | No | Yes |
| Lesson 8 | No | No | Yes |
| Total | 0 | 0 | 8 |

| Unit-5 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Yes |
| Lesson 2 | Yes (2days) | Yes | Yes |
| Lesson 3 | Yes (2days) | Yes | Yes |
| Lesson 4 | Yes (2days) | Yes | Yes |
| Lesson 5 | Yes (2days) | Yes | Yes |
| Lesson 6 | Yes (2days) | Yes | Yes |
| Lesson 7 | Yes | Yes | Yes |
| Lesson 8 | Yes | Yes | Yes |
| Total | 14 | 8 | 8 |

| Unit-6 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Yes |
| Lesson 2 | Yes (2days) | Yes | Yes |
| Lesson 3 | Yes (2days) | Yes | Yes |
| Lesson 4 | Yes (2days) | Yes | Yes |
| Lesson 5 | Yes (2days) | Yes | Yes |
| Lesson 6 | Yes (2days) | Yes | Yes |
| Lesson 7 | Yes (2days) | Yes | Yes |
| Lesson 8 | Yes (2days) | Yes | Yes |
| Lesson 9 | Yes (2days) | Yes | Yes |
| Lesson 10 | Yes (2days) | Yes | Yes |
| Lesson 11 | Yes | Yes | Yes |
| Lesson 12 | Yes | Yes | Yes |
| Total | 22 | 12 | 12 |

| Unit-7 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Yes |
| Lesson 2 | Yes (2days) | Yes | Yes |
| Lesson 3 | Yes (2days) | Yes | Yes |
| Lesson 4 | No | Yes | Yes |
| Lesson 5 | Yes (2days) | Yes | Yes |
| Lesson 6 | Yes (2days) | Yes | Yes |

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|--------------|-------------|-----------|-----------|
| Lesson 7 | Yes (2days) | Yes | Yes |
| Lesson 8 | No | Yes | Yes |
| Lesson 9 | Yes (2days) | Yes | Yes |
| Lesson 10 | No | Yes | Yes |
| Lesson 11 | Yes | Yes | Yes |
| Lesson 12 | Yes | Yes | Yes |
| Total | 18 | 12 | 12 |

| Unit-8 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Yes |
| Lesson 2 | Yes (2days) | Yes | Yes |
| Lesson 3 | Yes (2days) | Yes | Yes |
| Lesson 4 | No | Yes | Yes |
| Lesson 5 | Yes (2days) | Yes | Yes |
| Lesson 6 | Yes (2days) | Yes | Yes |
| Lesson 7 | Yes (2days) | Yes | Yes |
| Lesson 8 | Yes (2days) | Yes | Yes |
| Lesson 9 | Yes (2days) | Yes | Yes |
| Lesson 10 | Yes (2days) | Yes | Yes |
| Lesson 11 | Yes (2days) | Yes | Yes |
| Lesson 12 | No | Yes | Yes |
| Lesson 13 | Yes | Yes | Yes |
| Lesson 14 | Yes | Yes | Yes |
| Total | 22 | 14 | 14 |

| Unit-9 Lesson # | Non AP Course | AB Course | BC Course |
|------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Yes |
| Lesson 2 | Yes (2days) | Yes | Yes |
| Lesson 3 | Yes (2days) | Yes | Yes |
| Lesson 4 | Yes (2days) | Yes | Yes |
| Lesson 5 | Yes (2days) | Yes | Yes |
| Lesson 6 | Yes (2days) | Yes | Yes |
| Lesson 7 | Yes (2days) | Yes | Yes |
| Lesson 8 | Yes (2days) | Yes | Yes |
| Lesson 9 | Yes | Yes | Yes |
| Lesson 10 | Yes | Yes | Yes |
| Total | 18 | 10 | 10 |

| Unit-10 Lesson # | Non AP Course | AB Course | BC Course |
|-------------------------|----------------------|------------------|------------------|
| Lesson 1 | Yes (2days) | Yes | Yes |
| Lesson 2 | Yes (2days) | Yes | Yes |
| Lesson 3 | Yes (2days) | Yes | Yes |
| Lesson 4 | No | Yes | Yes |
| Lesson 5 | Yes (2days) | Yes | Yes |

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|--------------|-------------|----------|----------|
| Lesson 6 | Yes (2days) | Yes | Yes |
| Lesson 7 | No | Yes | Yes |
| Lesson 8 | Yes | Yes | Yes |
| Lesson 9 | Yes | Yes | Yes |
| Total | 12 | 9 | 9 |

| Unit-11 Lesson # | Non AP Course | AB Course | BC Course |
|-------------------------|----------------------|------------------|------------------|
| Lesson 1 | No | Yes | Yes |
| Lesson 2 | No | Yes | Yes |
| Lesson 3 | No | Yes | Yes |
| Lesson 4 | No | Yes | Yes |
| Lesson 5 | No | Yes | Yes |
| Lesson 6 | No | Yes | Yes |
| Lesson 7 | No | Yes | Yes |
| Lesson 8 | No | Yes | Yes |
| Lesson 9 | No | Yes | Yes |
| Total | 0 | 9 | 9 |

| Unit-12 Lesson # | Non AP Course | AB Course | BC Course |
|-------------------------|----------------------|------------------|------------------|
| Lesson 1 | No | No | Yes |
| Lesson 2 | No | No | Yes |
| Lesson 3 | No | No | Yes |
| Lesson 4 | No | No | Yes |
| Lesson 5 | No | No | Yes |
| Lesson 6 | No | No | Yes |
| Lesson 7 | No | No | Yes |
| Total | 0 | 0 | 7 |

| Unit-13 Lesson # | Non AP Course | AB Course | BC Course |
|-------------------------|----------------------|------------------|------------------|
| Lesson 1 | No | No | Yes |
| Lesson 2 | No | No | Yes |
| Lesson 3 | No | No | Yes |
| Lesson 4 | No | No | Yes |
| Lesson 5 | No | No | Yes |
| Lesson 6 | No | No | Yes |
| Lesson 7 | No | No | Yes |
| Lesson 8 | No | No | Yes |
| Lesson 9 | No | No | Yes |
| Lesson 10 | No | No | Yes |
| Lesson 11 | No | No | Yes |
| Lesson 12 | No | No | Yes |
| Lesson 13 | No | No | Yes |
| Lesson 14 | No | No | Yes |
| Total | 0 | 0 | 13 |

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| Unit-14 Lesson # | Non AP Course | AB Course | BC Course |
|-------------------------|----------------------|------------------|------------------|
| Lesson 1 | No | Yes | Yes |
| Lesson 2 | No | Yes | Yes |
| Lesson 3 | No | Yes | Yes |
| Lesson 4 | No | Yes | Yes |
| Lesson 5 | No | Yes | Yes |
| Lesson 6 | No | Yes | Yes |
| Lesson 7 | No | Yes | Yes |
| Lesson 8 | No | Yes | Yes |
| Lesson 9 | No | Yes | Yes |
| Lesson 10 | No | Yes | Yes |
| Lesson 11 | No | Yes | Yes |
| Lesson 12 | No | Yes | Yes |
| Total | 0 | 11 | 12 |