

**Department of Mathematics**

**Title of Course: Analytic Geometry & Calculus II**

**Class hours: 4**

**Course: MAT 302**

**Lab hours (if applicable):**

**Semester:**

**Instructor:**

**Credits: 4**

**Tel#:**

**Office:**

**Email:**

**Course Description:** This course is an introduction to the concepts of formal integration. It covers the differentiation and integration of algebraic trigonometric and transcendental functions. Topics include the definite integral, the anti-derivative, areas, volumes and the improper integral.

**Prerequisites/Co-requisites:** Calculus I (MAT 301) or the equivalent with departmental approval

**Student Learning Outcomes:**

- 1) Students will be able to find the anti-derivative of both algebraic and transcendental functions
- 2) Students will be able to use the Riemann sums to find the area under a curve
- 3) Students will be able to apply the First and Second Fundamental Theorems of Calculus
- 4) Students will be able to use the definite integral to evaluate areas, volume, arc lengths and surface areas
- 5) Students will be able to use traditional integration techniques such as substitution, integration by parts, trigonometric substitutions and partial fractions to find anti-derivatives
- 6) Students will be able to understand the concept of the improper integral

**Required Text:** Calculus- Alternate by Roland E. Larson, Robert P. Hostetler and Bruce H. Edwards SIXTH EDITION; Houghton Mifflin Co, 1998

**Other Resources (if applicable):**

**Use of Technology:**

MAT 302 has a computer laboratory component. Students utilize computer software such as graphing packages, a computer algebra system, and a mathematical word processor to complete laboratory assignments associated with their calculus course.

**Evaluation and Requirements of Students:** At the beginning of the semester, the instructor will advise the students of the determination of the final grade which is based on classwork, examinations, quizzes and the final examination. Students are required to attend all scheduled classes.

## Outline of Topics

TOPICS	TEXT PAGES
<b>Chapter 5: Integration</b>	
5.1 Anti-derivatives and Indefinite Integrals	229 - 237
5.2 Area	239 - 248
5.3 Riemann Sums and the Definite Integral	250 - 258
5.4 The Fundamental Theorem of Calculus	260 - 267
5.5 Integration by Substitution	269 - 279
<b>Chapter 6: Applications of Integration</b>	
6.1 Area of a Region Between Two Curves	293 - 299
6.2 Volume: The Disc Method	301 - 309
6.3 Volume: The Shell Method	313 - 318
6.4 Arc Length and Surfaces of Revolution	320 - 327
6.5 Work	329 - 35
6.6 Fluid Pressure and Fluid Force	337 - 342
6.7 Moments, Centers of Mass, and Centroids	344 - 352
<b>Chapter 7 &amp; 8: Transcendental Functions</b>	
7.2 Integration of Exponential Functions	365 - 369
7.6 Logarithmic Functions and Integration	393 - 398
8.4 Integrals of Trigonometric Functions	449 - 474
8.5 Integrals Involving Inverse Trigonometric Functions	468 - 474
<b>Chapter 9: Integration Techniques and Improper Integrals</b>	
9.1 Basic Integration Formulas	491 - 497
9.2 Integration by Parts	498 - 506
9.3 Trigonometric Integrals	508 - 516
9.4 Trigonometric Substitution	518 - 525
9.5 Partial Fractions	528 - 536
9.6 Integration by Tables and Other Integration Techniques	538 - 543
9.7 Improper Integrals	545 - 553

### College Attendance Policy

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

### Academic Adjustments/Students with Disabilities:

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities (Room N320; 220-8180). BMCC is committed to providing equal access to all programs and curricula to all students.

### BMCC Policy Statement on Plagiarism:

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

Students who are unsure of how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's web site, [www.bmcc.cuny.edu](http://www.bmcc.cuny.edu).

