**Title of Course:** Analytic Geometry & Calculus II  
**Course:** MAT 302  
**Semester:**  
**Credits:** 4  

**Class hours:** 4  
**Lab hours (if applicable):**  
**Instructor:**  
**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

Chapter 5: Integration
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

Chapter 6: Applications of Integration
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

Chapter 7 & 8: Transcendental Functions
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

Chapter 9: Integration Techniques and Improper Integrals
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.