



ESSEX COUNTY COLLEGE
Mathematics and Physics Division
MTH 122 – Calculus and Analytic Geometry II
Course Outline

Course Number & Name: MTH 122 Calculus and Analytic Geometry II

Credit Hours: 4.0 **Contact Hours:** 4.0 **Lecture:** 4.0 **Lab:** N/A **Other:** N/A

Prerequisites: Grade of "C" or better in MTH121 or placement

Co-requisites: None

Instructor: Nadia Lvov

Email:TBA

Office Hours: By appointment

Course Description: This course is a continuation of MTH 121. Topics covered include techniques of integration with applications of surface area and arc length, parametric equations, polar coordinates, conic sections, and infinite sequences and series.

Textbook: *Calculus: Early Transcendentals*, 8th edition, by Stewart; published by Cengage/Brooks/Cole, 2016

General Education Goals: The aggregate of the core courses required for any major at ECC have the following goals:

1. **Written and Oral Communication:** Students will communicate effectively in both speech and writing.
2. **Quantitative Knowledge and Skills:** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

3. **Scientific Knowledge and Reasoning:** Students will use the scientific method of inquiry through the acquisition of scientific knowledge.
4. **Technological Competency/Information Literacy:** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.
5. **Society and Human Behavior:** Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.
6. **Humanistic Perspective:** Students will analyze works in the field of art, music, or theater; literature; and philosophy and/or religious studies; and will gain competence in the use of a foreign language.
7. **Historical Perspective:** Students will understand historical events and movements in World, Western, non-- - Western, or American societies and assess their subsequent significance.
8. **Global and Cultural Awareness of Diversity:** Students will understand the importance of global perspective and culturally diverse peoples.
9. **Ethics:** Students will understand ethical issues and situations.

Course Goals: Upon successful completion of this course, students should be able to do the following:

1. demonstrate knowledge of the fundamental concepts and theories from calculus; (GEG 2)
2. utilize various problem-solving and critical-thinking techniques to set up and solve applied problems in engineering, sciences, business, and technology fields; (GEG 2)
3. communicate accurate mathematical terminology and notation in written and/or oral form in order to explain strategies to solve problems as well as to interpret found solutions; (GEG 1, GEG 2) and
4. use appropriate technology, such as graphing calculators and computer software, effectively as a tool to solve such problems as those described above. (GEG 2)

Attendance Policy: Regular and prompt attendance is essential for academic success. Faculty members take attendance at each scheduled class session. Students are expected to attend and be on time for all classes. Individual faculty members may establish specific attendance policies. Attendance records will be turned in to the appropriate Division/Department Chair and/or Program Director at the end of the term and in the interim upon request. Any students with more than three unexcused absences will automatically fail the course.

Methods of Evaluation: Final course grades will be computed as follows:

Grading Components
% of final course grade

- **Homework** **15 %**

A perusal of homework problems will indicate the extent to which students master course objectives.
- **2 Tests** (dates specified by the instructor) **30 %**

Tests will show evidence of the extent to which students meet course objectives, including, but not limited to, identifying and applying concepts, analyzing and solving problems, estimating and interpreting results, and stating appropriate conclusions using correct terminology.
- **Midterm Exam** **25 %**

The midterm exam will show evidence of the extend to which students achieved the first half of the course objectives.
- **Final Exam** **30 %**

The **comprehensive** final exam will examine the extent to which students have understood and synthesized all course content and achieved all course objectives.

Grading System:

A	90% - 100%	Superior
B+	87% - 89%	Very Good
B	80% - 86%	Good
C+	77% - 79%	Above Average
C	70% - 76%	Satisfactory
D	60% - 69%	Passing
F	59% - 0	Failing

Academic Integrity: Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College. Academic dishonesty includes, but is not limited to, the following:

- plagiarism – the failure to acknowledge another writer’s words or ideas or to give proper credit to sources of information;
- cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
- interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and
- fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions. Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

Student Code of Conduct: All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College’s Code of Conduct.

Course Content Outline: This is a tentative course schedule, the instructor reserve the right to make changes on it to make it better for the student’s development. Notice will be given should any changes take place.

Class Meeting

(120 minutes)	Topics to be Covered/ Class Activities
1	Orientation & Course Introduction/Review of Class Syllabus
	CHAPTER 7 TECHNIQUES OF INTEGRATION
	7.1 Integration by Parts
2	7.2 Trigonometric Integrals
3	7.3 Trigonometric Substitution
4	7.4 Integration of Rational Functions by Partial Fractions

Class Meeting**(120 minutes)****Topics to be Covered/ Class Activities**

5	7.7 Approximate Integration
6	7.8 Improper Integrals
7	Test #1 on Chapters 7
	CHAPTER 6 APPLICATIONS OF INTEGRATION
8	6.1 Areas Between Curves
9	6.2 Volumes
10	6.3 Volumes by Cylindrical Shells
	6.4 Work
11	6.5 Average Value of a Function
	CHAPTER 8 FURTHER APPLICATION OF INTEGRATION
12	8.1 Arc length
	8.2 Area of a Surface of Revolution
	CHAPTER 11 INFINITE SEQUENCE AND SERIES
13	11.1 Sequences
14	11.2 Series
	11.3 The Integral Test and Estimates of Sums
15	Midterm Exam (covers chapter 6, 7 and 8)
16	11.4 The Comparison Test
17	11.5 Alternative Series
18	11.6 Absolute Convergence and the Ratio and Root Test
19	11.8 Power Series
20	11.9 Representation of Functions as Power Series
21	11.10 Taylor and Maclaurin Series

Class Meeting**(120 minutes)****Topics to be Covered/ Class Activities**

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Test #2 on Sections 11.1 – 11.6**CHAPTER 10 PARAMETRIC EQUATIONS AND POLAR COORDINATES**

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10.1 Curves Defined by Parametric Equations

10.2 Calculus with Parametric Curves

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10.3 Polar Coordinates

10.4 Areas and Lengths in Polar Coordinates

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Final Exam (covers all chapters discussed in this course)