

Common Course Outline

ENSC 241

Numerical Methods

4 Semester Hours

The Community College of Baltimore County

Description

Numerical Methods

Covers error analysis, numerical solution of nonlinear equation, interpolation, splines, data fitting, numerical integration, Gaussian Elimination, LU factorization, matrix inversion, and numerical solution of ODE's.

Prerequisite: CMSC 201, Corequisites: MATH 251 or consent of instructor.

Overall Course Objectives

Upon successfully completing the course, students will be able to:

1. analyze problems to determine appropriate programming solutions.
2. use an object-oriented or structured programming language for problem solving.
3. debug logic-based programming errors.
4. develop well-written and documented programs up to a few hundred lines in length.
5. describe the steps in the problem solution
6. possibly work in a team environment.
7. create algorithms to solve problems
8. implement the algorithms.
9. analyze the algorithm design
10. apply basic structures to solve problems

Major Topics

- I. Roots of algebraic and transcendental functions
- II. Matrix applications
- III. Solutions of Simultaneous Algebraic Equations
- IV. Curve fitting and cubic spline interpolation handling
- V. Numerical Integration

Course Requirements

Grading: Grading procedures will be determined by the individual faculty member, will be provided the first week of class, and will include the following:

1. Computer Projects: Students will develop several computer programming projects, ranging from introductory labs to complex multi-layered scientific or mathematical projects. Programming time outside of class is required to complete projects.
2. At least two Tests, Exams, and/or Quizzes: Individual faculty will notify students of the testing procedures to be used.
3. Comprehensive Final Exam: The course will include a comprehensive final exam, which may include a final project.

Final Grades: Grades will be determined by individual faculty members.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.

The Community College of Baltimore County is committed to providing a high-quality learning experience that results in growth in knowledge, attitudes, and skills necessary to function successfully as a transfer student, in a career and as a citizen. To accomplish this goal, we maintain high academic standards and expect students to accept responsibility for their individual growth by attending classes, completing all homework and other assignments, participating in class activities and preparing for tests.

We take seriously our responsibility to maintain high-quality programs and will periodically ask you to participate in assessment activities to determine whether our students are attaining the knowledge, attitudes and skills appropriate to various courses and programs. The assessment activities may take many different forms such as surveys, standardized or faculty-developed tests, discussion groups or portfolio evaluations. We ask that you take these activities seriously so that we can obtain valid data to use for the continuous improvements of CCBC's course and programs.