

**Course Outline**  
**SURV 241**  
**Minor Engineering III – Storm Drain Design**  
3 Semester Hours  
2 Lecture Hours  
2 Lab hours

**The Community College of Baltimore County**

**Description**

Minor Engineering III - Storm Drain Design

Continues SURV 236; introduces the principles and requirements of storm drain design in preparation for the Maryland State Surveyors Licensing Examination; covers basic hydraulic theory; the design of storm drain systems to handle rainfall, runoff, erosion and erosion controls; ditches, culverts, sediment and detention basins. 3 credits; 2 lecture hours per week; 2 hours per week of laboratory required.

Prerequisite is SURV 236, equivalent experience or permission of the Department Coordinator.

**Overall Course Objectives**

Upon completion of this course the student will be able to:

1. calculate the volume of rainfall runoff using the rational method.
2. calculate the size of a ditch and/or pipe to convey water.
3. analyze a storm drain system consisting of ditches, inlets, and pipes.
4. calculate a storm drain system consisting of ditches, inlets, and pipes.
5. analyze culverts, inlet and outlet control.
6. calculate and design culverts.
7. compute open channel flow using Manning's Equation.
8. analyze Storm Sewer Systems.
9. calculate and design Storm Sewer Systems.

**Major Topics**

- I. The Rational Method
  - A. Drainage Area
  - B. Runoff Coefficients
  - C. Drainage Area Delineations
  - D. Time of Concentration
  - E. Rainfall Intensity
- II. Open Channel Flow Calculations using Manning's Equation
  - A. Gutter Flow Elements
  - B. Composite Channel Computation
  - C. Inlets Analysis
  - D. Inlets Computations
- III. Critical Flow
- IV. Storm Drain System
- V. Storm Sewer Design and Analysis
- VI. Culvert Design and Analysis
- VII. SCS Methodology

## **Course Requirements**

Grading/exams: Grading Procedures will be determined by the individual faculty member but will include the following:

1. Quizzes, tests, exams: Individual instructors will notify students of procedures, but as a minimum, three tests will be required.
2. Comprehensive Final Exam: The course will require a comprehensive final exam.

## **Other Course Information**

This course is a core course in Surveying Degree and Certificate Programs.

This course is taught in a classroom environment.