J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: CIV 241 **Credits:** 3

Course Title: Applied Hydraulics and Drainage I

Course Description: Presents the basic fundamentals of hydrology and hydraulics to the practical problems of drainage design. Stresses the use of design aids with supportive theory to ensure an understanding of the background, the theory of development, basic assumptions, and limitations of the various methods of estimating storm water runoff, and hydraulic structure design. Part I of II. Prerequisite: MTH 115 or equivalent. Lecture 3 hours per week.

General Course Purpose: Design class as applied to civil engineering hydraulic projects

Course Prerequisites and Co-requisites:
Prerequisite: MTH 115 or equivalent

Course Objectives:
Upon completing the course, the student will be able to
a. Demonstrate the methods of computing peak discharges;
b. Prescribe which method(s) to apply to which situation;
c. Demonstrate uniform flow computations and single section analysis;
d. Design ditches and channels;
e. Design protective linings for ditches and channels;
f. Demonstrate an understanding of culvert hydraulics;
g. Demonstrate an understanding of inlet design procedures;
h. Demonstrate an understanding of storm sewer design procedures; and
i. Design a complete storm drain system.

Major Topics to Be Included:
a. Rational method
b. The Synder and Anderson methods
c. Regression equations
d. Mannings equation--single section analysis
e. Bernoulli's equation--water surface profiles
f. Riprap and ditch lining design
g. Hydraulic design of culverts
h. Culvert design procedures, considerations, and limitations
i. Drop inlet design
j. Storm sewer design
k. Hydraulic gradeline
l. Design problems

Effective Date of Course Content Summary: August, 2008