CIVE 612 OPEN-CHANNEL FLOW
COLORADO STATE UNIVERSITY
Spring 2015

Instructor: Prof. Timothy K. Gates, B209 Engineering, 491-5043
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Office Hours: 10 - 11 Monday, 11 - 12:30 Wednesday, or by appointment.

Objectives: To develop (1) insight into the basic physical principles that govern the way water flows in open channels, (2) analytical and mathematical skills that are needed to describe and predict the behavior of open-channel flow using modern computational tools, and (3) an ability to effectively apply these principles and skills in the engineering solution of open-channel systems problems.

Tentative Schedule:

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<th>Date</th>
<th>Topic</th>
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| 20 – 27 January | Introduction to the Course  
Analyzing Open-Channel Hydraulic Systems  
Modeling Physical Systems  
Field Trip to the Cache la Poudre River |
| 27 January – 10 February | Governing Equations for Cross-Section-Averaged, 1-D Flow  
Modeling Irregular Hydraulic Geometry in Open Channels |
| 10 – 12 February | Classification of Open-Channel Flow  
Froude Number: Subcritical and Supercritical Flow  
Velocity and Momentum Correction Factors |
| 17 – 24 February | Energy Principle and Application to Steady Flow through Transitions  
Uniform Flow Concepts and Hydraulic Resistance  
Estimating Hydraulic Resistance Using Field Data  
Hydraulic Control in Open Channels |
| 24 February – 5 March | Gradually- and Spatially-Varied Flow  
Developing Computational Algorithms for Gradually-Varied Flow |
| 10 - 12 March   | Hydraulic Jumps  
Rapidly-Varied, Steady Flow through Hydraulic Structures in Channels |
| 14 - 22 March   | Spring Break |
| 24 – 31 March   | Rapidly-Varied, Steady Flow through Hydraulic Structures (Cont) |
| 2 April         | Mid Semester Exam |
| 7 - 9 April     | Design of Canal Systems |
| 14 – 21 April   | Introduction to Computational Modeling of Unsteady Open-Channel Flow |
| 23 - 30 April   | Computer Models for Gradually- and Spatially-Varied Flow Analysis  
Computer Models for 1D and 2D Unsteady Flow Analysis |
| 5 - 7 May       | Dealing with Uncertainty in the Modeling of Open-Channel Flow  
Revisit to the Cache la Poudre River  
Course Review |
| 12 May          | Final Exam (6:20 – 8:20 PM) |

Selected journal articles.

Website: We are in the process of converting CIVE 612 to the new Canvas online learning system. In the meantime, the following webpage will be used to post course information: http://www.engr.colostate.edu/CIVE612/course_info.html

Homework: This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog (page 7) and the Student Conduct Code (http://tilt.colostate.edu/integrity/honorpledge/index.cfm). The Honor Pledge (attached) with a place for the student’s signature must be applied to every exam and assignment turned in for this course. Please make sure that you read, understand, and comply with the Policy on Academic Integrity in CIVE 612 statement on the class website.

Reading assignments from the textbook, handouts, and papers will be made for which students will be held accountable. Analytical and design problems will be assigned throughout the semester. Many problems will require solution using Excel spreadsheets. A major computational modeling project will be due at the end of the semester. No late homework will be accepted.

Grading: Regular Homework Problems – 20% of grade; Special Computational Modeling Project – 25%; Mid Semester Exam – 25%; Final Exam – 30%.

A: 90-100%
B: 75-89%
C: 60-74%
D: 50-60%
F: <50%

Term grades for this course will use the +/- grading system as described in the CSU catalog.
CSU Student Honor Pledge

I pledge on my honor that I have not received or given any unauthorized assistance in this exam [assignment] [academic work].

Signature: _____________________________

Date: __________________________