

Class: **CIVE 717 03(3-0-0) RIVER MECHANICS - Spring 2012**

Professor: P.Y. Julien Eng. Bldg., Room A207H, pierre@engr.colostate.edu
Engineering Research Center, Room B205, 491-8450

Description: Analysis of rivers, mechanics of water and sediment transport emphasizing alluvial systems, channel stabilization, control, response.

Prerequisite: CE716 or the equivalent.

Course Topic Outline: River basins; review of steady and unsteady flow in rivers; river equilibrium; river dynamics; aggradation and degradation; local scour; engineering analysis of fluvial systems; river stabilization; river dynamics and response; river engineering; navigation and dredging; physical and mathematical river models; and waves and tides in river estuaries.

Lectures: Tuesday -Thursday, 3:30 - 4:45 pm, Eddy 119
Remodeling and move to Clark C337 from 2/13 – 3/11

Office Hours: Campus – Tuesday 1:30-3:15 and Thurs. 2:30-3:15.
ERC - afternoons of MWF

Web-page: The course's web page is
http://www.engr.colostate.edu/~pierre/ce_old/classes/ce717/ce717.html

Computer Model: The purpose is to develop modeling skills for one-dimensional river flows. The assignments require programming and calculations of aggradation-degradation.

Field Trip: The purpose is to develop observational skills in the river environment. Your team assignment is to observe and report on river stabilization measures of the South Platte River near Denver.

Text: P. Julien, "River Mechanics", Cambridge University Press, 2002

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| Evaluation: | Homeworks (6) | 60% |
| | Field Trip Report | 20% |
| | Computer Problems (1) | 20% |

CE 717 – RIVER MECHANICS

SPRING, 2012

| | | Assignment On web | Tentative DUE date |
|----------|------------------------------------|------------------------------|-------------------------------|
| Jan. 18 | Introduction | Comp. Prob. | |
| Jan. 25 | Upland Erosion | Hw # 1 | |
| Feb. 1 | Sources and Yield | | Comp. Prob. |
| Feb. 8 | At-a-station Hydraulic Geometry | Hw # 2 | Hw # 1 |
| Feb. 15 | Flow in Bends | | |
| Feb. 22 | Unsteady Flow | Hw # 3 | Hw # 2 |
| March 1 | River Stability and Equilibrium | | |
| March 8 | River Response | Field Trip | Hw # 3 |
| March 15 | SPRING BREAK | | |
| March 22 | River Dynamics | Hw # 4 | |
| March 29 | Riverbank Stabilization | | Field Report |
| April 5 | Physical Modeling | Hw # 5 | Hw # 4 |
| April 12 | Local Scour | | |
| April 19 | River Engineering | Hw # 6 | Hw # 5 |
| April 26 | Waves and Tides | | |
| May 3 | Guest Lectures | | Hw # 6 |
| May 10 | FINALS WEEK | No final | |

| CE 717 - SUGGESTED READING | | |
|-----------------------------------|--|-------------------|
| AUTHOR | TITLE ... <i>For your information only</i> | CALL NO. |
| VANONI | Sedimentation Engineering | TA 7/A5/#54 |
| SIMONS | Sediment Transport Technology | TC 175.2/S57/1977 |
| GRAF | Hydraulics of Sediment Transport | TC 175.2/G7 |
| RICHARDSON | Highways in the River Environment | TA 7/C6/#49 |
| SHEN | River Mechanics, Vol. 1 & 2 | TC 175/S49 |
| RAUDKIVI | Loose Boundary Hydraulics | TC 175.2/R3/1967 |
| SHEN | Sedimentation Symposium | TC 175/S488 |
| SIMONS | Resistance to Flow in Alluvial Channels | 119/16/#422-J |
| BOGARDI | Sediment Transport in Alluvial Streams | TC 175.2/B6413 |
| BLENCH | Mobile-Bed Fluviology | TC 175.2/B55 |
| YALIN | Mechanics of Sediment transport | TC 175.2/Y35/1977 |
| SHEN | Modeling of Rivers | GB 201.72/M35M6 |
| ELLIOTT | River Meandering | GB 1205/C67/1983 |
| SHEN | Environmental Impact of Rivers | TC 177/S48 |
| SIMONS | Engineering Analysis of Fluvial Systems | TC 405/E54 |
| HEY | Gravel-Bed Rivers | TC 175/G73/1982 |
| SCHUMM | The Fluvial System | GB 561/S35 |
| CHOW | Open Channel Hydraulics | TC 175/C45 |
| SHEN | Institute of River Mechanics | TA 7/C612 |
| FISCHER et al. | Mixing in Inland & Coastal Waters | TC 171/M57 |
| ROZOVSKII | Flow of Water in Bends of Open Channels | TC 175/R683 |
| ROUSE | Advanced Fluid Mechanics | QA 90/R58 |
| HENDERSON | Open Channel Flow | TC 175/H45 |
| YEVJEVICH | Unsteady Flow in Open Channels | TC 175/I57 |
| WANG | International Symposium on River Sedimentation III | TC 175.2/I58 |
| JULIEN | Essays on River Mechanics | TA 7/C6 |