**CIV E 439 SYLLABUS**

COURSE NAME: Water Resources Engineering Design- CIV E 439
DETAILS: 3 hour lectures, 3/1 hour Lab
TERM: Winter

COURSE DESCRIPTION

\*4.5 (fi 8) (second term, 3-0-3) Design of hydraulic structures and river engineering works, including: dams,

spillways, energy dissipators, bridges, culverts, erosion protection and river training works. Students work in

teams on a design project.

REQUIRED MATERIAL

**Mandatory**

Due to the breadth and depth of material covered, there is no one text that is adequate for this course.

**Recommended**

Material discussed in class will therefore form a fundamental part of the reference material. Supplementary

notes and handouts will be provided electronically on eClass.

An online version of the following text book is available through the University of Alberta Library:

• Guide to Bridge Hydraulics by the Road and Transport Association of Canada (2004)

LECTURE CONTENT

|  |  |  |
| --- | --- | --- |
| **No.** | **Topic** | **Start Date** |
| 1 | Intro. To River Engineering Design | 7-Jan |
| 2 | River Model Calibration | 9-Jan |
| 3 | Floodplain Delineation | 14-Jan |
| 4 | Bridge Hydraulics | 21-Jan |
| 5 | Bridge Scour | 28-Jan |
| 6 | Stormwater Pond Design | 4-Feb |

LAB CONTENT

|  |  |
| --- | --- |
|  | **Laboratory Schedule** |
|  |  |  |  |
| **Lab****date** | **Lab Description** | **Homework Assignment** | **Submissions due at the start of the lab** |
| **14-Jan** | **Lab 1 - Project 1** | **Homework 1 - Project 1** |  |
| *Hydrology and FP roughnessses* | *1990 flood profile calibration* |  |
| **21-Jan** | **Lab 2 - Project 1** | **Homework 2 - Project 1** | **Homework 1 - Project 1** |
| *1:100, 1:20 & encroachment anaylses* | *Floodplain delineation* | *1990 flood profile calibration* |
| **28-Jan** | **Lab 3 - Project 2** |  | **Homework 2 - Project 1** |
| *Bankfull & existing bridge anal* |  | *Floodplain delineation* |
| **4-Feb** | **Lab 4 - Project 2** | **Homework 3 - Project 2** |  |
| *Design Q & freeboard analysis* | *Hydraulic design of new bridge* |  |
| **11-Feb** | **Lab 5 - Project 2** |  | **Homework 3 - Project 2** |
| *Scour analysis for new bridge* |  | *Hydraulic design of new bridge* |
| **18-Feb** | **READING WEEK** |
| **25-Feb** | **Lab 6 - Project 3** |  |  |
| *SWMM Model Set-up* |  |  |
| **3-Mar** | **Lab 7 - Project 3** |  | **Lab 6 - Solution** |
| *Pipe Design* |  | *SWMM Model Set-up* |
| **10-Mar** | **Lab 8 - Project 3** |  | **Lab 7 - Solution** |
| *Pond Geometry* |  | *Pipe Design* |
| **17-Mar** | **Lab 9 - Project 3** |  | **Lab 8 - Solution** |
| *Outlet Structure* |  | *Pond Geometry* |
| **24-Mar** |  |  | **Lab 9 - Solution** |
|  |  | *Outlet Structure* |
| **31-Mar** | **Group Oral Presentations** |  |  |
|  |  |  |
| **7-Apr** | **Group Oral Presentations** |  |  |
|  |  |  |