The University of Jordan University  
Faculty of Engineering

Course Syllabus

Course Title: Hydraulic structures  
Course Number: 0951561  
Department: Civil Engineering  
Designation: Elective  
Prerequisite(s):  
Instructor: Dr. Nidal Hadadin  
Instructor's Office: CE 316  
Instructor's e-mail: nhadadin@hu.edu.jo  
Office Hours: ((10:00-11:00) and (1:00-2:00 ) Sunday, Tuesday, Thursday

Time:  
Class Room: CE 2001 and E 2015


Other required material: Notes prepared by instructor

Course objectives: This course is intended for senior level students who have completed a course in a hydraulic Engineering. The objectives of this course is to develop:
1) insight into the basic physical principles that govern the control of flows in hydraulic systems,
2) analytical and mathematical skills needed to describe and predict flow conditions in hydraulic structures , and
3) ability to effectively apply these principles and skills to the analysis and design of structures in hydraulic system.

Topics covered:  
1. Introduction to the course  
2. principles of hydraulic system analysis  
3. classification and use of structures for flow control  
4. Channel regulating structures  
5. Flow measurement structures  
6. Channel protective structures  
7. Channel Grade control structures  
8. Dams spillways and outlet works  
9. Energy dissipation and drop structures  
10. Cross drainage culverts, pipes

Class/laboratory schedule:  
sec. (1): 3 class sessions each week; 60 minutes Sunday , Tuesday and Thursday  
Sec. (2): 2 class sessions each week; 90 minutes each, (Mond. And Wend).

Grading Plan:  
Midterm Exam (30 Points)  
Others (10 Points)  
Final Exam (50 Points)  Will be announced by the by registrar
**Course contribution:**

<table>
<thead>
<tr>
<th>Professional Component</th>
<th>Course Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>None</td>
</tr>
<tr>
<td>Basic Science and Mathematics</td>
<td>Applying numerical analysis, differential equation, integration to solve some hydraulic problems</td>
</tr>
<tr>
<td>Engineering Science</td>
<td>Present each topic clearly and completely enough that the student will develop, identify, formulate, understand, and solve engineering problems in depth by utilizing the governing conservation equations of mass, momentum and energy</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>Design of hydraulic structure, such Channel regulating structures, Flow measurement structures, Channel protective structures, Channel Grade control structures, Dams spillways and outlet works, Energy dissipation and drop structures, Cross drainage culverts, pipes</td>
</tr>
</tbody>
</table>

**Course outcomes:**

<table>
<thead>
<tr>
<th>ABET a-k</th>
<th>CE Program Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>An ability to apply knowledge and principles of mathematics, science, and engineering to solve engineering problems</td>
</tr>
<tr>
<td>b</td>
<td>An ability to design and conduct experiments, as well as to analyze and interpret data.</td>
</tr>
<tr>
<td>c</td>
<td>An ability to design a system, component or process to meet desired needs.</td>
</tr>
<tr>
<td>d</td>
<td>An ability to identify engineering problems.</td>
</tr>
<tr>
<td>e</td>
<td>An ability to formulate engineering problems.</td>
</tr>
<tr>
<td>f</td>
<td>An ability to solve engineering problems.</td>
</tr>
</tbody>
</table>

**ABET Program Criteria for Civil Engineering Achieved:**

**CIVIL ENGINEERING PROGRAM CRITERIA**

Programs must demonstrate that graduates have:

- A. proficiency in mathematics through differential equations, probability and statistics, calculus-based physics, and general chemistry;
- B. proficiency in a minimum of four (4) recognized major civil engineering areas;
- C. the ability to conduct laboratory experiments and to critically analyze and interpret data in more than one of the recognized major civil engineering areas;
- D. the ability to perform civil engineering design by means of design experiences integrated throughout the professional component of the curriculum; and
- E. an understanding of professional practice issues.

**Prepared by:** Dr. Hadadin  
**Date:** 1/2/2016