Course Title: Computer Applications Engineering  
Course Number: 0901303  
Department: Civil Engineering  
Designation: Elective  
Prerequisite(s): Reinforced Concrete II  
Instructor: Dr. Nasim Shatarat  
Instructor's Office: n.shatarat@ju.edu.jo  
Office Hours: M, W (8:30-9:30) (12:30-2:00)  
Time: M, W (9:30-11:00)  
Class Room: Comp. Lab  
Course description: This course reviews the fundamentals of the stiffness and finite elements methods, introduces the analysis and design of different elements in different types of structures using available computer package(s).  
Textbook(s): Non  
Other required material: Non  
Course objectives: The objective of the course is to provide an overlook over the available structural analysis packages. The course will demonstrates the steps followed to produce the structural analysis and design of different types of structures; steel and concrete buildings, bridges, water tanks and trusses.  
Topics covered:  
- Analysis of prismatic and non-prismatic continuous beams (General Loading, Temperature loading, …).  
- Analysis of prismatic and non-prismatic plane frames.  
- Analysis of prismatic and non-prismatic 3D frames.  
- Staged construction (frames under construction, cable stayed bridge,…etc) .  
- Analysis of slabs.  
- Analysis of bridges (influence line,…).  
- Analysis of arches and domes .  
- Hydrostatic pressure (Water Tanks).  
- Introduction of concrete and steel design  
Class/laboratory schedule: 2 class sessions each week; 75 minutes each  
Grading Plan:  
First Exam (20 Points) Mon. 13 - March- 2017 Class time  
Second Exam (20 Points) Mon. 17 - April- 2017 Class time  
Final Exam (50 Points) Will be announced by the registrar  
Others (10 Points) Project  
General Notes: Attendance is required. Students will be administratively dropped from the course for more than 15% unexcused absences. All students are expected to arrive to class on time and prepared to work. Students absent from lectures will be responsible for all material covered during the sessions. Students are expected to do their own work individually. Students are expected not to share their homeworks or projects with others.
Course contribution:

<table>
<thead>
<tr>
<th>Professional Component</th>
<th>Course Contribution</th>
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<tbody>
<tr>
<td>General Education</td>
<td>None</td>
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<tr>
<td>Basic Science and Mathematics</td>
<td>None</td>
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<tr>
<td>Engineering Science</td>
<td>Students will demonstrate the ability to apply concepts of engineering mechanics and structural analysis</td>
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<tr>
<td>Engineering Design</td>
<td>Students will demonstrate the ability to size structural steel and concrete components for applicable strength and serviceability limit states according to the current codes</td>
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Relationship to program outcomes:

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<tr>
<th>ABE T a-k</th>
<th>CE Program Outcomes</th>
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<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>
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<tr>
<td>c</td>
<td>5% An ability to design a system, component or process to meet desired needs.</td>
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<tr>
<td>d</td>
<td>An ability to function on multi-disciplinary teams</td>
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<tr>
<td>e</td>
<td>50% An ability to identify, formulate, and solve engineering problems.</td>
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<tr>
<td>f</td>
<td>An understanding of professional and ethical responsibility</td>
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<td>g</td>
<td>An ability to communicate effectively developed through report writing and in class presentations.</td>
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<td>h</td>
<td>The broad education necessary to understand the impact of engineering solutions in a regional and local context</td>
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<tr>
<td>i</td>
<td>A recognition of the need for, and ability to engage in life-long learning</td>
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<tr>
<td>k</td>
<td>45% An ability to use the techniques, skills, and, modern engineering tools necessary for engineering practice.</td>
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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. Nasim Shatarat                 Date:    29/1/2017