

# CVLE 423 Steel Design (I)

Course Layout – Fall 2015-2016

<b>Curricular Area</b>	Civil Engineering – Structural Sequence	
<b>Type of Course</b>	Mandatory - Major	
<b>Catalogue Description</b>	Introduction to steel structures. Structural floor framing systems. Bracing systems. Tension members. Compression members. Bolted and welded truss connections. Laterally supported beams. Lateral torsion buckling of beams. Detailing.	
<b>Prerequisites by Courses</b>	CVLE 212	
<b>Prerequisites by Topics</b>	Elementary Structural Analysis	
<b>Instructors</b>	Dr. Hassan Ghanem (h.ghanem@bau.edu.lb) Block D Office --- (Phone Ext 4308)	
<b>Course schedule/rooms</b>	Section 1 Tuesday 11:00 – 12:30 pm (D208) Thursday 11:00 – 12:30 pm (BT112)	Section 2 Tuesday 09:30 – 11:00 pm (BT312) Thursday 09:30 - 11:00 am (BT110)
<b>Office Hours</b>	Monday: 11:00 - 12:00 Tuesday: 08:00 - 9:30 Wednesday: 10:00 - 12:00 Thursday: 08:00 - 09:30 and 13:00 – 14:00	
<b>Load</b>	3 credits; 2 Lecture-sessions/week – 75 min per session	
<b>Textbook</b>	W.T. Segui, “Steel Design”, Fifth Edition, Thomson, 2013	
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. Manual of Steel Construction, American Institute of Steel Construction (AISC), 2005.</li> <li>2. J.C. McCORMAC, <i>Structural Steel Design</i>, Fourth Edition, Pearson Education Int., 2008</li> </ol>	
<b>Topics</b>	<b>Week [1]</b> 31/08/2015	<ol style="list-style-type: none"> <li>1. Introduction to steel structures                             <ul style="list-style-type: none"> <li>• Advantages and problems</li> <li>• Steel Profiles</li> <li>• Grades &amp; mechanical properties of Steel</li> <li>• Loads, combinations and Specifications</li> </ul> </li> </ol>
	<b>Week [2]</b> 07/09/2015	<ol style="list-style-type: none"> <li>2. Framing &amp; Stability of Steel Structures                             <ul style="list-style-type: none"> <li>• Beam-column system</li> <li>• Frame or truss system</li> <li>• Advanced systems</li> <li>• Bracing systems</li> </ul> </li> </ol>
	<b>Week [3-5]</b> 14/09/2015	<ol style="list-style-type: none"> <li>3. Tension Members                             <ul style="list-style-type: none"> <li>• Failure modes</li> <li>• Net area &amp; effective net area</li> <li>• Analysis &amp; design of tension members</li> </ul> </li> </ol>
	<b>Week [6-7]</b> 05/10/2015 <b>Exam 1</b>	<ol style="list-style-type: none"> <li>4. Compression Members                             <ul style="list-style-type: none"> <li>• Euler’s buckling load</li> <li>• Elastic &amp; Inelastic buckling</li> <li>• Effective buckling length</li> <li>• Analysis &amp; design of compression members</li> </ul> </li> </ol>
	<b>Week [8-10]</b> 19/10/2015	<ol style="list-style-type: none"> <li>5. Truss Connections                             <ul style="list-style-type: none"> <li>• Types of bolts &amp; welds</li> <li>• Bearing type bolted connections</li> <li>• Fillet welded connections</li> <li>• Detailing</li> </ul> </li> </ol>
	<b>Week [11-15]</b> 02/11/2015	<ol style="list-style-type: none"> <li>6. Beams                             <ul style="list-style-type: none"> <li>• Failure modes</li> <li>• Laterally supported beams</li> <li>• Elastic &amp; inelastic lateral torsion buckling</li> </ul> </li> </ol>

	<b>Exam 2</b>	• Design provisions
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<b>Learning Outcomes Correlation with</b>	<b>Program Outcomes</b>	<b>Program Objectives</b>
Able to select a functional steel structural flooring system.	a-b	1
Knowledge in the failure modes and behavior of tension, compression, and beam steel members.	a-b	1-2
Able to apply the basic concepts for analysis and design of tension, compression, and beam steel members.	b-d	2-3
Ability to verify the failure type and design of bolted and welded truss connections.	b-d	2-3
Knowledge in design of various steel beams.	b-d	2-3
Students gain teamwork skills for analysis, design and detailing of steel members.	d-g-h	3-4

<b>Learning Outcomes Assessment Tools</b>	<b>Exams</b>	<b>HW s</b>	<b>Lab Reports</b>	<b>Project Report</b>	<b>Course Survey</b>
Able to select a functional steel structural flooring system.	✓	✓			✓
Knowledge in the failure modes and behavior of tension, compression, and beam steel members.	✓	✓			✓
Able to apply the basic concepts for analysis and design of tension, compression, and beam steel members.	✓	✓			✓
Ability to verify the failure type and design of bolted and welded truss connections.	✓	✓			✓
Knowledge in design of various steel beams.	✓	✓			✓
Students gain teamwork skills for analysis, design and detailing of steel members.	✓	✓			✓

**Assessment:**

1. Bi-weekly Assignments: (05%)
2. Quiz: (25%)
3. Mid-term exam: (30%)
4. Final exam: (40%)
5. **ZERO-TOLERANCE** policy on cheating and plagiarism.

**Attendance:** Attendance is **mandatory**. Class attendance will be taken and students will be penalized for absences according to the rules set by BAU regulations, and specified in the CE Student Manual; i.e. students who miss more than one-fifth of the sessions of any course in the first ten weeks of the semester will be required to withdraw from the course with a grade of "AW".

**Assessment Dates**

**Quiz :** (October 08, 2015)  
**Mid-Term Exam:** (November 17, 2015)  
**Final Exam:** (January 11, 2016)

<b>Course Coordinator</b>	Dr. Adnan Masri
<b>Date</b>	September, 2013