KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Structural Systems Syllabus			
Course Title	**Structural Systems**		
Course Code	**CVE4370**	**No. of Credits**	**3 CH**
Department	**Civil Engineering Department**	**Faculty**	**Engineering**
Pre-requisites Course Code	**Construction Engineering (CVE4360)**	**Co-requisites Course Code**	
Course Coordinator(s)	**Prof Dr Jalal Ahmed Saeed**		
Email	**jalal.saeed@komar.edu.iq**		
Other Course Teacher(s)/Tutor(s)	**None**		
Learning Hours	**Section 1: Tuesday (08:00 to 09:30) & Thursday (08:00 to 09:30), Room 103**		
Contact Hours	**Sunday (15:00 to 16:00) and Tuesday (15:00 to 16:00)**		
Course Type	**Department Requirement**		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

This course **CVE4370** deals with structural systems with an emphasis and concentration on what is related to the design of steel and composite structures. It is recommended for *senior* students in the civil engineering program at KUST who are interested in learning structural systems, specially the design of steel and composite structures.

COURSE OBJECTIVES

The main objectives of this course are:

- To learn the behavior and design of structural steel and composite components, for example: Tension and Compression members, Connections in truss and frame structures, Beams and Columns ----------etc
- To gain an educational and comprehensive experience in the design of simple steel and composite structures.

COURSE LEARNING OUTCOMES

After participating in the course, students would be able to:

1. Understand the basic concepts of design of structural steel members and composite members as well [ABET Program Outcome (**a**)].
2. Solve engineering problems related to selection of structural steel standard sections [ABET Program Outcome (**e**)].
3. Apply the techniques of failure that is possible to happen in both structural steel and composite members [ABET Program Outcome (**k**)].
4. Analyze and design to select the most appropriate economical structural elements. [ABET Program Outcome (**c**)].

Grading Scale:

Points	Percentage Scores
A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	75-79
C	70-74
C-	65-69
D+	60-64
D	55-59
D-	50-54
F	0-49
W	Withdrawal
I	Incomplete

Note: The minimum passing grade to pass this course is C-which is equivalent to 65%.

COURSE CONTENT

Course topics include:

Section 1: Introduction to Structural Systems
Section 2: Materials and Properties
Section 3: Tension Members
Section 4: Truss Analysis and Design
Section 5: Bolted and Welded Joints and Connections
Section 6: Design of Simple Flexural Steel Members (Beams)
Section 7: Design of Continuous Steel Beams
Section 8: Plate Girders
Section 9: Compression Members – Steel Columns
Section 10:Base and Bearing Plates
Section 11:Composite Construction (Concrete and Steel structural components)

COURSE TEACHING AND LEARNING ACTIVITIES

1. CVE 4370 will consist of 15 weeks of lectures (including holidays and breaks).
2. Students will be assigned Home Works, Exams, and a (GDP) Group Design Project.
3. Oral Discussions and Quizzes
4. Debates and Class Activities

COURSE ASSESSMENT TOOLS		
Assessment Tool	**Description**	**Weight**
Quizzes (4)	There will be four quizzes as scheduled in the course schedule.	10 %
Assignments (2)	Two assignments will be given at weeks 7 and 13.	5 %
Midterm	The midterm exam will be conducted after week 7 that covers Sections 1 – 5 (included) as scheduled in the course schedule.	25 %
Group Design Project	Group Design Project to be performed on analyzing and designing of an Industrial Building or a warehouse.	10 %
Test	There will be test after week 12 that covers Sections 6 – 10 (included) .	20 %
Final Exam	The final exam will be conducted after week 15 that covers all the Sections started from Section 1 to Section 11.	30 %

ESSENTIAL READINGS: (Journals, textbooks, website addresses etc.)

References:

Textbook and Related Design Manuals:

1. C Salmon and J Johnson " *Steel Structures, Design and Behaviour* ", Harper & Row Publishers, Inc.
2. AISC (2008). *Manual of Steel Construction – ASD & LRFD Combined Methods*, 13th edn, American Institute of Steel Construction.

Other References:

1. Gaylord and Gaylord, " Design of Steel Structures ".
2. AISC (2001). *Manual of Steel Construction – Load and Resistance Factor Design*, 3rd edn, American Institute of Steel Construction.
3. Lamberd Tall, " Structural Steel Design ".
4. J Bowels, " Structural Steel Design ".
5. Gaylord and Gaylord, " Structural Engineering handbook"
6. Beedle, " Plastic Design of Steel Frames ".
7. B Krishnamachar and D A Simha, " Design of Steel Structures ".
8. J McCormac, " Structural Steel Design ".

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance policy - Students are expected to attend all the lectures and to adequately perform all the work assigned by the Coordinator.

Tardy policy - All the assigned work must be submitted by the due date and time. Submissions that are 24 hours late will be penalized for 25% of the grade. Those which are 24 - 48 hours late will be penalized for 50% of the grade. After that, submissions will not be accepted. Exceptions can be made for students with emergencies or special circumstances approved by the Department.

Make-up policy - Students are expected to take the exams on the assigned dates and times. Make-up exams may be arranged for students with emergencies or special circumstances approved by KUST officials.

Quality of Submissions - Students are encouraged to submit their work on engineering clean white paper **[A4]**. They have to explain and show all calculations including appropriate references to the AISC specifications and final drawings of designed structures.

Academic Dishonesty:
Any type of dishonesty such as Plagiarism, Copying from others, etc will be found guilty and subject to punishment by the University Consul according to the regulations

KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Note: Supplementary problems will be given either as homework in the text book and which are posted in the Google Classroom and during the class.

Week	Beg/End Dates	Topics (Sections)	Course Assignments	CLO's
1	**28-2 to 3-3 / 2016**	**Section 1: Structural Systems** - Introduction - Structural Design - Structural Members - Structural Connections - Structural Loads		**Outcome # 1**
2	**6-3 to 10-3 / 2016**	**Section 2: Materials & Properties** • Structural Steel • Properties • Specifications • Structural Shapes • Design Tables • Design criteria for tension members		**Outcome # 1**
3	**13-3 to 17-3 / 2016**	**Section 3: Tension Members** • Yielding , Fracture • Examples • Effective net area • Special cases		**Outcomes # 1 & 3**
Nawroz Holiday (21-3 to 24-3 / 2016)				
4	**27-3 to 31-3 / 2016**	**Section 3: Tension Members – Contd.** • Design examples	**Quiz 1**	**Outcome # 2**
5	**3-4 to 7-4 / 2016**	**Section 3: Tension Members – Contd.** • Staggered Bolts • Design examples		**Outcomes # 2 & 4**
6	**10-4 to 14-4 / 2016**	**Section 4: Truss Analysis & Design** • Design of roof sheets • Purlins and Sag rods • Design of truss members (for tension and compression)	**Quiz 2**	**Outcome # 4**
7	**17-4 to 21-4 / 2016**	**Section 5: Bolted and Welded Joint Connections** • Design of connections	**Assignment 1**	**Outcome # 4**
	22-4 to 28-4 / 2016	**Mid Term Exam**		

8	**1-5 to 5-5 / 2016**	**Section 6: Design of Simple Flexural Steel Members** • Compact and non-compact sections • Design examples		**Outcomes # 2 & 4**
9	**8-5 to 12-5 / 2016**	**Section 7: Design of Continuous Steel Beams** • Design equations • Design examples		**Outcomes # 2 & 4**
10	**15-5 to 19-5 / 2016**	**Section 8: Plate Girders** • Specifications • Design example	**Quiz 3**	**Outcomes # 2 & 4**
11	**22-5 to 26-5 / 2016**	**Section 9: Compression Members – Steel Columns** • Design equations • Specifications & design charts • Design examples		**Outcomes # 2 , 3 & 4**
12	**29-5 to 2-6 / 2016**	**Section 10: Base and Bearing Plates** • Design examples	**Quiz 4**	**Outcome 4**
		Test		
13	**5-6 to 9-6 / 2016**	**Section 11: Composite Construction- Concrete & Steel** • Introduction • Composite action	**Assignment 2**	**Outcomes # 1 & 4**
14	**12-6 to 16-6 / 2016**	**Section 11: Composite Construction- Concrete & Steel, Contd.** • Composite beams • Composite slabs		**Outcomes # 1 & 4**
15	**19-6 to 23-6 / 2016**	**Review Week for Academic Courses**		
16	**24-6 to 30-6 / 2016**	**Final Examination for Academic Courses**		

J. A. Saeed

Instructor
Prof Dr Jalal A Saeed

Department Approval