Kingdom of Saudi Arabia Ministry of Higher Education **Qassim University** College of Engineering	Qassim University جامعة القصيم	المملكة العربية السعودية وزارة التعليم العالي **جامعة القصيم** **كلية الهندسه**

CE 613 Advanced Steel Design

College: Engineering

Department: Civil

First: Course Definition

1- Course Code: CE 613

2- Units: 3

3- Semester:

4- Prerequisite:

5- Co-requisite:

6- Location (if not on main Campus):

Second: Course Objectives

1- To develop understanding of *ultimate behavior of steel structural members*
2- To Develop understanding of *buckling and stability of steel members and frames*
3-To develop understanding of *the theory of torsion*
4-To understand the understanding of *lateral-torsional buckling of beams*
5-To develop capability to *analyze and design curved beams*
6- To develop understanding of *post-buckling strength of plates versus post-buckling behavior of columns*

Third: Course Specifications

Theories of ultimate behavior of metal structural members with emphasis on buckling and stability of members and frames; theory of torsion applied to beam torsion, lateral-torsional buckling, curved beams with emphasis on design criteria; post-buckling strength of plates and post-buckling versus column behavior.

1- Topics to be covered

Subject	No of Weeks	Units

An introduction to different analysis and design methods	2	3
Buckling and stability of different structural members and frames	2	3
Theory of torsion and its application	2	3
Curved beams analysis and design	2	6
Theory of plates	2	6
Post buckling strength of plates	2	6
Column behaviour	1	3
Post buckling behaviour of columns	1	3

2- Course components (Total hrs in the Semester): 42

Lecture	Design	Other
42	-	0

3- Intended Learning Outcomes of the Course (ILO's)

a. *Knowledge*

i) *Description of the knowledge to be acquired:*

- *Ultimate behavior of steel structural members*
- B*uckling and stability of steel members and frames.*
- *The theory of torsion*
- *Lateral-torsional buckling of beams*
- A*nalyze and design curved*
- P*ost-buckling strength of plates versus post-buckling behavior of columns* Concrete and fire

ii) Teaching strategies to be used to develop that knowledge

- Class lectures.
- Design classes
- Term projects.
- Students' presentations.
- Group discussion.

iii) Methods of assessment of knowledge acquired

- Exams.
- Quizzes.
- Class and homework assignments.
- Term projects.

b- Cognitive (Intellectual) Skills

i) Cognitive skills to be developed

- Advanced concepts analysis and design methods.
- Theory of plates and shells and its application
- Buckling of structural members and frames

ii) Teaching strategies to be used to develop these cognitive skills

- Class lectures.
- Design classes
- Case studies analysis.
- Term projects.

iii) Methods of assessment of students' cognitive skills

- Students' seminars and presentations.
- Term projects.
- Written reports.

c. Interpersonal Skills and Responsibility

i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Decision making based on engineering analysis.
- Communication skills.
- Team work.

ii) Teaching strategies to be used to develop these skills

- Class lectures.
- Term projects.
- Case studies analysis.

iii) Methods of assessment of students' interpersonal skills and capacity to carry responsibility

- Term project.
- Written reports.
- Students' seminars and presentations.

d. Communication, Information Technology and Numerical Skills

i) Description of the skills to be developed in this domain

- Literature research.
- Problems modeling.
- Utilization of computer applications in analysis and design.

ii) Teaching strategies to be used to develop these skills

- Class lectures.
- Case studies analysis.
- Computer lab sessions.
- Term projects.

iii) Methods of assessment of students numerical and communication skills

- Term projects.
- Written reports.
- Students' seminars and presentations.

e. Psychomotor (if applicable) & Other Non-cognitive Skills

i) Description of the psychomotor or other skills to be developed and the level of performance required

- NA
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ii) Teaching strategies to be used to develop these skills-

- NA
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iii) Methods of assessment of student's psychomotor skills

- NA
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4- Student Assessment Schedule

Serial	*Assessment tool (test, group project, examination etc.)*	*Week due*	*Weight*
1	Design classes	Continuous	15%
2	Term Project – 1	3rd	10 %
3	Mid Term Exam -1	7th	15 %
4	Term Project – 2	10th	10 %
5	Term Project – 3	13th	10 %
5	Final Exam	16th	40 %

5- Student Support

- Providing electronic library of textbooks and scientific periodicals.
- Providing the necessary computer applications for the course.

6- Learning Resources

i) Essential Books (References)

-Charles G. S., John E. J., and Faris A. M. "Steel Structures: Design and Behaviour," Prentice Hall, 2008

- Tamboli, A. " Handbook of Steel Connection Design and Details," McGraw-Hill, 200

ii) Course Notes

- NA
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iii) Recommended Books

- Charles G. S., John E. J., and Faris A. M. "Steel Structures: Design and Behaviour," Prentice Hall, 2008
- Tamboli, A. " Handbook of Steel Connection Design and Details," McGraw-Hill, 2009

iv) Electronic Books & Web Sites:

- Engineering Structures

v) Periodicals

- ASCE scientific journals.

7- Course Evaluation and Improvement Processes

i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Students' questioners.
- Students' evaluation of course and instructor.

ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Public faculty seminars.
- Assessment by external evaluators of students achievements.

iii) Processes for Improvement of Teaching

- Assessment of students' work by external examiners.
- Analysis of students' evaluation of course and instructor.
- Seminars by industry professionals.

iv) Processes for verifying standards of student achievement

- Check marking by an independent faculty member of a sample of student work.
- Periodic exchange and remarking of a sample of assignments/exams with a external evaluator.

v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Assessment and evaluation of the level of achieving the course outcomes through a continuous improvement process (part of a quality assurance system established by the university),
- Consequently, actions are to be taken to improve the course delivery when necessary.
- Review of the course objectives, outcomes and curriculum every 2 years.