

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		<p>المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة</p>
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CE 651 Advanced Highway Design

College: Engineering

Department: Civil

First: Course Definition

1- Course Code: CE 651

2- Units: 3

3- Semester:

4- Prerequisite:

5- Co-requisite:

6- Location (if not on main Campus):

Second: Course Objectives

- 1- To provide experience in evaluating rural and urban street and highway design theory.
- 2- To provide experience in establishing design criteria and application to street and highway systems.
- 3- To provide experience in basic design skills of intersections and interchanges.
- 4- To provide experiences in basic design skills of urban freeway aspects.
- 5- To provide experiences in computer applications.

Third: Course Specifications

1- Topics to be covered		
Subject	No of Weeks	Units
Evaluation of Rural and Urban Street and Highway Design Theory.	2	6
Establishment of Design Criteria and Application to Street and Highway Systems.	2	6
Establishment of Design Criteria and Application to Intersections.	2	6

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Establishment of Design Criteria and Application to Interchanges.	2	6
Drainage Design.	2	6
Urban freeway Design Aspects.	2	6
Computer Applications	2	86

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

Lecture	Exercise	Other
42	-	0

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

a. Knowledge

i) Description of the knowledge to be acquired:

- Evaluation of rural and urban street and highway design theory.
- Establishment of design criteria and application to street and highway systems.
- Admixtures of hot asphalt concrete.
- Establishment of design criteria and application to intersections.
- Establishment of design criteria and application to interchanges.
- Drainage design.
- Urban freeway design aspects.
- Computer applications.

ii) Teaching strategies to be used to develop that knowledge

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

iii) Methods of assessment of knowledge acquired

- Exams.
- Quizzes.
- Homework assignments.
- Term projects.

b- Cognitive (Intellectual) Skills

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i) Cognitive skills to be developed

- Evaluation of rural and urban street and highway design theory.
- Establishment of design criteria, application to street and highway systems, and to intersections and interchanges.
- Drainage design.
- Urban freeway design aspects.
- Computer applications.

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

- Class lectures.
- 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

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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

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

- NA

iii) Methods of assessment of student's psychomotor skills

- NA

4- Student Assessment Schedule

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

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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)

- Rogers, M. "Highway Engineering," Wiley-Blackwell; 2nd edition, 2008. ISBN-10: 1405163585, ISBN-13: 978-1405163583
- Mannering, F. L., Washburn, S. S. and Kilareski, W. P. "Principles of Highway Engineering and Traffic Analysis," Wiley; 4th edition, 2008. ISBN-10: 0470290757, ISBN-13: 978-0470290750

ii) Course Notes

- NA

iii) Recommended Books

- American Association of State Highway and Transportation Officials (AASHTO) "A Policy on Geometric Design of Highways and Streets," 5th Edition, 2004. ISBN-10: 1560510684, ISBN-13: 978-1560510680
- American Association of State Highway and Transportation Officials (AASHTO) "Roadside Design Guide," 2002.

iv) Electronic Books & Web Sites:

- Scientific journals and forums.
- Instructor's instruction.

v) Periodicals

- Highway Research Board journal.
- Highway Research Bulletin.
- ASCE scientific journals.

7- Course Evaluation and Improvement Processes

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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.