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

CE 640 Urban Transportation Planning & Modeling

College: Engineering

Department: Civil

First: Course Definition

1- Course Code : CE 640

2- Units : 3

3 – Semester

4 -Prerequisite

5- Co-requisite

6- Location (if not on main Campus):

Second: Course Objectives

١. Develop an understanding of the Analytical techniques for estimating future travel demands; and for planning of transportation facilities and locations .
2. Review of transportation technology and future systems.
3. Apply mathematical models for decision making in planning and operations of urban highway and transit systems.

Third: Course Specifications

1- Topics to be covered

Subject	No of Weeks	Units
Urban Transportation Planning: Definition and Context , Characteristics of urban transportation systems	2	6
Introduction to GIS and TransCAD Introduction to spatial objects: points, polygons, lines, routes, etc.	1	3
Transportation data management and analysis	1	3
Trip Generation modeling TransCAD : Maps, layers, buffers, data linkages and	2	6

spatial queries		
Trip Distribution modeling TransCAD : Tables, dataviews, and selecting records	2	6
Mode choice models -1	2	6
Mode choice models -2	2	6
Supply analysis	1	3
Project Evaluation and Implementation	1	3

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:

- Transportation Planning and Decision Making
- Geographic information System (GIS)
- TransCAD 4.0
- Travel Demand Modelling with TransCAD
- Trip Generation modeling
- Trip Distribution modeling
- Supply Analysis

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

i) Cognitive skills to be developed

- Advanced concept of urban transport planning and modeling
- running simulations in TransCAD
- Evaluation of transportation infrastructure investment alternatives

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

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

- Literature research.

- Problems modeling.
- Utilization of computer applications in analysis and modeling.

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**
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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	3rd	15 %
2	Mid Term Exam -1	7th	15 %
3	Term Project – 2	10th	15 %
4	Term Project – 3	13th	15 %
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)

- Meyer, M. and Miller, E. J. "Transportation Planning," McGraw-Hill Science/Engineering/Math; 2 edition, 2000. ISBN-10: 0072423323, ISBN-13: 978-0072423327

- Ortzar, J. and Willumsen, L. G. "Modeling Transport," Wiley; 4 edition, 2011. ISBN-10: 0470760397, ISBN-13: 978-0470760390

ii) Course Notes

- NA

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iii) Recommended Books

- Stopher, *P. R. and* Meyburg, *A. H. "Urban transportation modeling and planning," Lexington Books; 2 edition,1975.*
- *Meyer, M. D. and Miller, E. J. "Urban Transportation Planning: A Decision-Oriented Approach," McGraw Hill, 1984. ISBN 0669969419, 9780669969412*
- *Harvey, G. and Deakin, E., "Manual of Regional Transportation Modeling Practice, National Association of Regional Councils," Washington, D.C., 1993.*

iv) Electronic Books & Web Sites:

- Scientific journals and forums.
- **http://www.caliper.com**
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v) Periodicals

- ASCE scientific journals.
- **ScienceDirect journal.**

7- Course Evaluation and Improvement Processes

i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Students' questioners.
- Students' evaluation of course and instructor.
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ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Public faculty seminars.
- Assessment by external evaluators of students achievements
- Instructor (Course) Report

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 (e.g. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- 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.