Text: There is no required text for the course. Handouts, technical papers, and reports will be provided to the students during the development of the course. Make sure that you have access to Blackboard and check the site on a regular basis. Additional helpful references are: *Public Infrastructure Asset Management, Second Edition* by W. Uddin, W. R. Hudson, and R. C. G. Haas, McGraw-Hill, 2013, *International Infrastructure Management Manual* by NAMS Group, 2006.

**DESCRIPTION**

CE 6301 covers infrastructure management concepts, models, and decision-support tools for the maintenance and rehabilitation of smart, resilient, and recoverable infrastructure systems. Emphasis is given in how to apply these concepts to real world infrastructure management problems to address societal needs for the development and preservation of livable communities.

**OBJECTIVES**

The objectives of CE 6301 are: (1) to introduce students to infrastructure problems and to discuss engineering and management approaches to address infrastructure challenges; (2) to explain the decision-making process to manage infrastructure assets; (3) to select the data needed to manage infrastructure assets in an agency; (4) to describe and discuss data collection and condition assessment methods for infrastructure management; (5) to discuss strengths and weaknesses of infrastructure management systems; (6) to apply decision-support tools to for smart, resilient, and recoverable infrastructure; (7) to discuss strategies to implement Infrastructure Management Systems (IMS) in an agency.

**TOPICS**

**MODULE 1: Fundamental Concepts of Infrastructure Management**
1.1 What is the Infrastructure Management Purpose?
1.2 An Overview of the Infrastructure Management Process
1.3 Infrastructure Management and Asset Management Systems
1.4 The Decision Making Process: Elements, and Tools

**MODULE 2: Infrastructure Management Elements and Analytical Methods for Decision Making**
2.1 Inventory
2.2 Storing and Managing Data
2.3 Condition Assessment of Infrastructure Assets
2.4 Needs Analysis
2.5 Forecasting Infrastructure Performance
2.6 Prioritization of Funds
2.7 “What if” Impact Analysis
2.8 Quantifying the Benefits of Infrastructure Management Strategies
MODULE 3: Implementing Infrastructure Management Systems

3.1 Tools for Infrastructure Management Systems
3.2 Barriers for the Implementation of Infrastructure Management Systems
3.3 Communicating Infrastructure Needs to Funding Authorities

Notes
(a) Topics will be presented by the instructor or guest speakers as a lecture or case study format.
(b) There will be topics assigned to the students individually or as a team to conduct research that will be follow up with a presentation and open class discussion.
(c) Handouts and course material will be provided during the development of the course. Students should review their e-mails periodically for communications related to the course. A virtual folder will be implemented to facilitate distribution of the course material.

EXAMINATIONS
Two exams will be given. The first exam will be about half way through the course. In accordance with University regulations, students who miss examinations will receive grades of zero. Exceptions to this rule will be made only on a carefully considered individual basis and only if the student contacts the instructor in writing before the exam. If you know in advance that you are going to miss an exam, it is your responsibility to inform the instructor in writing before the exam.

ASSIGNMENTS
Individual and team assignments will be given along the course. There will be assignments that require the use of software packages in their own laptops and others will be on-line tools. Students should be able to discuss and present the solutions in the class. Knowledge acquired in the assignments may be graded directly or through a quiz. Students will also be required to make individual or team class presentations on selected topics related to the course subject. The purpose of class presentations is to enhance oral communication skills that are vital for a successful professional career.

PROJECT TERM
Students are required to conduct research and prepare a project term paper on a selected infrastructure management topic assigned by the instructor. The final project term paper will be prepared in accordance with the American Society of Civil Engineers (ASCE) Author’s Guide.

ATTENDANCE
Students are expected to attend all class periods required by the instructor. Those who fail to attend class regularly will miss lectures and class learning activities. Students with four or more unexcused absences will be inviting scholastic difficulty may be dropped from the course with a grade of F.

GRADING
Your grade for this course will be determined on the basis of 100 points as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>40</td>
</tr>
<tr>
<td>Midterm</td>
<td>20</td>
</tr>
<tr>
<td>Final</td>
<td>20</td>
</tr>
<tr>
<td>Assignments</td>
<td>30</td>
</tr>
<tr>
<td>Project Term</td>
<td>30</td>
</tr>
</tbody>
</table>
Final grades are based on the normal distribution of points as shown below:

A  100 - 90
B  89 - 80
C  79 - 70
D  69 - 60
F  < 60

**POLICY ON CHEATING**

Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts (Regents Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). Scholastic dishonesty harms the individual, all students, and the integrity of the university. Policies on scholastic dishonesty will be strictly enforced.

**COURSE/INSTRUCTOR EVALUATION**

A course/instructor evaluation will be conducted in class near the end of the semester.

**FINAL COMMENT**

This course is designed for the students to understand infrastructure management concepts and tools learning how to apply them to address present and future infrastructure challenges. The instructor expects all the students to succeed in learning the course subjects. It is critical for your success to establish a good studying habit in order to do very well in this course. Please do not hesitate to ask questions in class, or see your instructor outside of class. Any specific comments that students have on how the course might be improved are particularly welcomed.