路面全生命周期无损检测及评量
Nondestructive Testing & Evaluation of Pavements from Cradle to Grave

课程简介及目标 Introduction to the Course and Objectives

1. Exposing the students to the fundamentals of the state of the art and the state of practice in nondestructive testing and evaluation of pavements,
2. Describing the basic theoretical and practical aspects of major nondestructive testing and evaluation
3. Discussing the aspects of transportation life cycle where the nondestructive testing and evaluation can be incorporated effectively and economically
4. Exposing the students to practical problems and their solutions through case studies and class interaction.

教授简介 Introduction to the Lecturer

德州大学埃尔帕索分校土木学系 纳叟贺教授 Prof. Soheil Nazarian, PhD, PE

纳叟贺教授是该校土木工程的麦肯塔司-莫金森主任教授及交通基础设施系统中心主任。纳教授在岩土和交通基础设施材料和无损测试领域有 25 年以上的经验。他在美国联邦和州公路局做过 100 多个研究项目的科研领导。他已经监督了 80 多位硕士和博士毕业生，大部分的毕业生在德州交通局及其他交通局与企业界工作。

Dr. Nazarian is the McIntosh Murchison Chair Professor of Civil Engineering and the Director of the Center for Transportation Infrastructure Systems at The University of Texas at El Paso (UTEP).

Dr. Nazarian has more than 25 years of experience in the areas of materials and nondestructive testing as related to geotechnical and transportation infrastructure. He has been the PI and co-PI of more than 100 research projects funded by federal and state agencies such as Texas Department of Transportation, Federal Highway Administration and Strategic Highway Research Program. Throughout his career at UTEP, he has supervised more than 80 Master's and PhD students. A large number of them working for TxDOT and other private and public transportation entities.

纳叟贺教授的课程讲授语言及内容将完全用英文。Prof. Nazarian will use solely English in his lectures.

先修课程及预读文献 Prerequisites and Pre-Course Literature Reading Assignment

- 代定 TBA

其他课程要求 Other Course Requirements

- 代定 TBA

课程大纲 Course Outline

Module A: Overview of Nondestructive Testing and Evaluation (NDT&E)

- Lecture A.1: Brief introduction to life cycle of pavements
  (construction, maintenance, rehabilitation, reconstruction strategies and data needs)
- Lecture A.2: Important parameters that impact life of rigid and flexible pavements
  (natural or stabilized subgrade, granular or stabilized subbase and bases, hot mix asphalt layer, concrete layer)
- Lecture A.3: Tools currently available for NDT&E of pavements
  (deflection methods, electric/electromagnetic methods, seismic/sonic methods, vibration methods including intelligent compaction)

Module B: Fundamentals of Nondestructive Testing and Evaluation (NDT&E) Part 1

Principles, available devices, data collection processes, data reduction process for each method

- Lecture B.1: Deflection methods
  (Falling Weight Deflectometers, Light Weight Deflectometers)
- Lecture B.2: Electric/Electromagnetic methods
  (air-launched and ground coupled Ground Penetrating Radar, Nonnuclear moisture/density devices)
- Lecture B.3: Seismic/sonic methods
  (Seismic Pavement Analyzer, Portable Seismic Analyzer and other devices)
- Lecture B.4: Other methods
  (Traffic Speed Deflectometers, Rolling Deflection Device, Intelligent Compaction Rollers, and other devices)

Module C: Case Studies of proper and improper use of NDTs

- Lecture C.1: Construction quality control
- Lecture C.2: Acceptance testing
- Lecture C.3: Pavement monitoring for maintenance and rehabilitation
- Lecture C.4: Pavement evaluation for reconstruction

Module D: Nondestructive Testing of Railbeds

- Lecture D.1: Ground Penetrating Radar
- Lecture D.2: Seismic methods
- Lecture D.3: Impulse methods

授课日程表 Class Schedule

每日授课 3 小时，5 日课程，共 15 小时。

The lectures will be conducted 3 hours a day for 5 days with a total of 15 hours.