MASTER OF SCIENCE | CIVIL ENGINEERING
geotechnical engineering

SMU | LYLE
SCHOOL OF ENGINEERING

To protect a riverfront community, engineers employ a computer modeling program that integrates climate data with soil characteristics to design stronger, more effective flood control levees.

For stabilizing a building site and preventing the subsidence of adjacent structures, specialists inject engineered microbes that precipitate an inorganic film which binds and stiffens the sandy soil.

To better understand activity along a fault line, scientists install a network of microelectronic sensors that continuously report on displacement, strain, temperature, fluid pressure, and other critical factors.

The global impact of once localized catastrophes, such as hurricanes, earthquakes and tsunamis. The decaying infrastructure of roads, bridges, and dams requiring not just repair but reengineering. The rising demand for energy combined with growing concern for climate change. With such seismic shifts the need for a new and deeper understanding of the most fundamental of all engineering structures and materials—the earth itself. This is the brave new world awaiting those who pursue the master's in civil engineering—with a focus in geotechnical engineering—at SMU-Lyle.

FIND US **HERE**

P.O. Box 750335 Dallas, Texas 75275
EngineeringLeaders@SMU.edu | lyle.smu.edu
214-768-2002

GEOTECHNICAL ENGINEERING

SMU | LYLE
SCHOOL OF ENGINEERING

EngineeringLeaders@SMU.edu
lyle.smu.edu
214-768-2002

ACADEMIC **PROGRAM**

Requirements include the completion of ten graduate level courses (30 CH), or the completion of eight courses (24 CH) and a thesis (6 CH).

Core Courses (15 CH)

Advanced Soil Mechanics
Foundation Engineering
Introduction to Solid Mechanics
Introduction to Structural Dynamics
Matrix Structural Analysis and Introduction to Finite Element Methods

Example Electives (15 CH or 9 CH and Thesis)

Basic Concepts of Structural Stability
Engineering Analysis with Numerical Methods
Finite Elements in Structural and Continuum Mechanics
Geotechnical Earthquake Engineering
Groundwater and Seepage
Special Projects (Geotechnical Engineering)
Theory of Elasticity
Thesis

ROCK TECHNOLOGY

Geotechnical engineering brings high technology down to earth. Through the latest advances in computer science, microelectronics, nanotechnology, and biotechnology, geotechnical engineers are gaining new and more precise tools for understanding and modifying the performance of rock and soil. The focus of Lyle's master's is on understanding such new technology and applying it to the study and design of earth structures. In this 30-hour program, students explore such core topics as solid foundation engineering, finite element analysis, and advanced soil mechanics. They then expand their studies through such fascinating electives as geotechnical earthquake engineering, groundwater control, and special topics courses designed to meet the needs of students in areas such as geothermal energy, soil stabilization, and seismic analysis of soil-structure systems. Graduates become fully grounded in applying the newest techniques of measurement and analysis to the most ancient of building materials.

STRUCTURE FOUNDATIONS

Lyle's master's in civil engineering—with emphasis in geotechnical engineering—is presented by an exceptionally qualified faculty whose own cross-disciplinary research initiatives—including computer simulation of granular micromechanics, soil/foundation/structure interaction, and computational geomechanics using discrete and finite element methods—touch the essential aspects of this fundamental field's high technology future. Courses are offered in small classes to ensure opportunities for strong mentoring and hands-on participation. Our goal is to help every student build a solid foundation for future accomplishment or future academic pursuits at the doctoral level.