



MASTER OF SCIENCE | CIVIL ENGINEERING
structural engineering



To reduce the cost of orbital delivery, engineers study the design of a 'space elevator,' a massive ribbon of carbon nanotubes that would stretch thousands of miles into space, with a manned multi-use platform at its midpoint in low-earth orbit.

To produce a more efficient airliner, a manufacturer develops a wing with the bird-like ability to change its aerodynamic shape in flight while supporting gross weights over 50 tons.

To replace a dangerously corroded bridge, a construction company engineers a replacement of fiber-reinforced concrete, combining greater esthetic properties with lower life-cycle costs.

From the Pyramids of Egypt to the International Space Station, structural engineers have supported mankind's highest aspirations. Today, as new high-strength materials and design technologies enable exciting new structural possibilities, urgent environmental concerns are also creating a demand for sustainable solutions—a world of challenges awaiting those who choose structural engineering as the focus of their master's in civil engineering at SMU-Lyle.

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STRUCTURAL ENGINEERING

ENGINEER FOUNDATIONS

Because lives are often riding on the results, structural engineering is perhaps the most exacting and unforgiving field of engineering. For that reason, professional standards of certification and licensing are reaching a level that will be difficult to meet without post-graduation education, through a program that stresses an in-depth understanding of current practices and applications as well as advanced developments. This is precisely how Lyle's master's in civil engineering—emphasizing structural engineering—is designed. In this 30-hour program, students increase their depth of understanding in solid mechanics, structural dynamics, advanced steel and concrete design, and other core subjects; then they extend the breadth of their knowledge through electives in such topics as geotechnical earthquake engineering, structural stability, and transportation planning. Students who may pursue a doctorate have the option of writing a thesis.

JOINT DEVELOPMENT

Lyle's structural engineering curriculum is presented by an exceptionally qualified faculty whose own research projects—in structural analysis, structural dynamics, including passive and active seismic response systems—are at the forefront of developments in this essential field and bring additional depth to the standard curriculum. Class sizes are kept small to ensure an advantageous student-teacher ratio and optimal opportunities for frequent one-to-one mentoring. SMU's goal is to produce graduates who are well-qualified to reach the highest standards of professional certification and personal success.

ACADEMIC PROGRAM

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

Core Courses (15 CH).

- Advanced Concrete Design
- Advanced Steel Design
- 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).

- Advanced Soil Mechanics
- Basic Concepts of Structural Stability
- Engineering Analysis with Numerical Methods
- Finite Element Methods in Structural and Continuum Mechanics
- Foundation Engineering
- Introduction to Construction Management
- Introduction to Structural Dynamics
- Prestressed Concrete
- Special Projects (Structural Engineering)
- Theory of Elasticity
- Theory of Plate Behavior
- Thesis