

# SECURE SYSTEMS

MASTER OF SCIENCE | SECURITY ENGINEERING



**SMU | LYLE**  
SCHOOL OF ENGINEERING

*Near a distant battlefield, a U.S. Navy vessel launches an unmanned reconnaissance aircraft using GPS to navigate itself toward an enemy stronghold. Its mission devised from tactical information delivered through a digital command network.*

*In a North Texas living room, a teenage boy plays an online video game with friends in other cities, using his home address to access the system.*

*In Atlanta, 300 people board one of nearly 2,500 planes departing that day, believing that they'll arrive safely thanks to the FAA's computer-based air traffic control system.*

What do these scenarios have in common? They illustrate the extent to which computer technology is now embedded in our lives. They point to the extreme need for cybersecurity in virtually every activity and to the critical demand for experts who can engineer systems that are totally secure against man-made attack or natural disaster ... experts being cultivated through the master's program in security engineering at SMU-Lyle.

## FIND US **HERE**

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*I completed the SMU master's program in security engineering in 2011 through a cohort that met on-site at my work location. The degree has allowed me to be a better, more well-rounded software engineer by understanding the importance of security and how it permeates every aspect of a program or project. The education has also provided my company and me with key subject matter expertise that will benefit all parties for years to come.*

**Brad Ford**  
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### DIRECT EXPERIENCE

Security engineering goes far beyond certification. Industry is looking for a broad range of capabilities in engineering, computer science, and business management—for people who can develop systems that have security designed into their physical assets as well as written into their code. Lyle's 30-hour master's program is built on a core curriculum covering data and network security, encryption and authentication, digital forensics, testing and quality assurance, fault tolerance, and more. Students also gain direct experience through projects that allow them to perform actual cyber attacks on software and servers. Developed in consultation with industry and government groups, including the Space and Naval Warfare Systems Command (SPAWAR), the curriculum is mapped to national standards.

### RESEARCH EXCELLENCE

Lyle's security engineering course content is delivered by an expert faculty, many of whom are deeply involved in ongoing security research. Through SMU's consortium of High Assurance Computing and Networking (HACNet) laboratories, they are engaged in such problems as: cloud security, embedded security, SCADA security, hardware Trojans and side channel attacks, disaster tolerant computing, and health care safety and security. Course specific topics are addressed by guest practitioners drawn from partner organizations, such as Lockheed Martin, Rockwell Collins, and Raytheon. In fact, through the Computer Science and Engineering Department, SMU is listed as a Center of Academic Excellence in Information Assurance Education by the Department of Homeland Security and the National Security Agency (NSA). For anyone looking for a challenging new career path or an opportunity to move up in their current organization, the place to start is the master's degree in security engineering at SMU-Lyle.

### ACADEMIC PROGRAM

Thirty credit hours of graduate courses are required with a minimum graduate GPA of 3.000 on a 4.000 scale.

#### **Satisfactory completion of all the core curriculum.**

Computer System Security  
Data and Network Security  
Operating Systems and Systems Software  
Software Security

#### **Satisfactory completion of three advanced elective courses.**

Advanced Data Mining  
Advanced Network Security  
Advanced Software Security  
Border and Transportation Security  
Cryptography and Data Security  
Digital Forensics  
Fault-Tolerant Computing  
Hardware Security and Trojan Detection  
Introduction to Data Mining and Related Topics  
Logistics Systems Engineering  
Security Economics  
Software Reliability and Safety  
Software Testing and Quality Assurance

#### **Satisfactory completion of three elective courses from available graduate-level course offerings in Lyle with approval from the program director or the department chair.**