

## *Curriculum for Cyber Defense Camps at UT Dallas*

### *Program Structure*

Each camp day will include instructor-led lectures, video lectures (when relevant), team-based hands-on lab exercises under the supervision of a teaching assistant, and a team-based solution write-up for the exercises and its video-recorded presentation to the entire class. The camps will also have visitors from the government and local industry to encourage students to pursue a college degree related to cyber security. Students will be issued a certificate of completion together with a document/transcript listing the topics covered and students' mastery level of each topic. Regarding domain knowledge, although we do not require any specific cyber security knowledge/expertise, we expect some of the students to be more prepared than some others. Based on our previous experience, we believe that our team structure will allow us accommodate students with mixed knowledge levels and will promote team work and peer learning. Each camp will accommodate up to 40 campers. Residential campers will use UT Dallas dormitory facilities for their lodging and UT Dallas Dining Hall facilities for their meals.

### *Curriculum*

We offer two summer camp programs one on fundamental cyber security topics (Fun-CySec) and the other on selected advanced topics (Adv-CySec). Students will develop an understanding of how to properly configure Windows and Linux systems while minimizing their exposure to various types of security attacks. Students will also learn about various services that computer systems provide and how to install, configure, and secure such services so as to minimize their exposure to attacks by remote adversaries. Students will also learn about various tools and applications that can be used to monitor, debug and troubleshoot problems with computer systems as well as computer communication networks. Below is an outline of daily activities in our camps:

***Fun-CySec Overview:*** Fun-CySec is a 3-week long cyber security fundamentals camp covering the following topics:

- An overview of cyber ethics and first principles of cybersecurity; an introduction to virtualization technologies; hands-on activity on building virtual machines using VMWare and VirtualBox virtualization technologies.
- Computer hardware; hands-on activity on building an operational computer system from a bag of computer parts and related troubleshooting tasks.



- An introduction to Microsoft Windows operating system; hands-on activity on system navigation on a Windows system.
- An introduction to computer networks; hands on activity on networking basics.
- Advanced networking topics; hands on activity on building a small virtual network and managing it.
- Advanced topics in Windows operating system; hands on activity on configuration and security administration on a Windows system.
- An introduction to Linux operating system; hands on activity on basic system navigation and file manipulation in Linux.
- Linux networking and security features; hands on activity on configuring Linux a system for networking and for various network services.
- Data recovery and computer forensics; hands on activity on using FTK to investigate forensic activities on a system.



**Adv-CySec Overview:** Adv-CySec is a 2-week long camp covering the following selected topics:

- Working with Windows Server Environment to run various network services; hands-on activity on installing, configuring, and running several network services on a Windows server.
- Windows Registry database that and Regedit tool; hands-on activity on using Regedit for various system and application configuration tasks.
- IEEE 802.11 WLANs and their security; hands-on activity on WLAN discovery and assessment of their security.
- Basic security tools for network and service discovery; hands-on activity on network and service discovery.
- An introduction to vulnerability assessment; penetration testing and



related tools; hands-on activity on using the tools to scan, discover, and exploit vulnerabilities in an isolated environment.