**Hardware Security – Instructor: Dr. Shayan (Sean) Taheri**

**Topics:**

1. Introduction to Hardware Security and Trust and HW Security Applications.
2. Overview of the Electronics and the Semiconductor Supply Chain from Security Perspective.
3. Introduction to Cryptography.
4. Basics of Computer Architecture, VLSI Design, and VLSI Testing.
5. Top-Down Security Analysis of Computing Systems.
6. Design of Hardware Encryption/Decryption Engines.
7. HW Security Based on PUFs and TRNGs: Attacks and Defenses.
8. Hardware Metering.
9. Watermarking of HW IPs.
10. Physical Attacks and Fault Injection Attacks.
11. Hardware Trojans: IC Trust (Taxonomy and Detection).
12. Hardware Trojans: IP Trust (Detection) + Design for Hardware Trust.
13. Reverse Engineering for Security.
14. Counterfeit Detection and Avoidance
15. Basics of PCB Security and FGPA Security.
16. Protection Against Scan-based Side Channel Attacks.
17. Side Channel Attacks and Countermeasures.
18. Physical Inspection and Assurance.
19. Security Considerations for AI Systems.