ECE 591-005/CSC 591-029
Cellular and Telephone Network Security

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Objective or Description: Cellular networks are essential to modern infrastructure. Not only do they power the daily communications of billions of individuals, they are and will be the primary access medium for over a billion people in developing regions.

Despite their ubiquity and importance, cellular networks present a number of unique security challenges.

In this course, we will study in detail how these networks function and the current state of the art of their security.

Prerequisites: A computer networking course at the undergraduate or graduate level (equivalent to CSC 401 or CSC 570) and a computer security class (examples include CSC 474, 574, 405); or permission of the instructor.

Topics: This course provides an in-depth investigation into security issues in areas including cellular air interfaces, core networking (SS7, IMS), cellular data networking, and mobile device architectures. In particular, we will study how these networks provide (or fail to provide) high confidentiality, integrity, availability, authentication, and privacy.

A key focus of the course will be how the design philosophy of telephone networks differs from the Internet, complicating traditional security solutions. The security of these networks are poorly understood by computing professionals, making competence in this area a rare and valuable skill.