

Selected Topics in Wireless System and Network Security

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Timetable: 10 hrs. First lecture on March 16, 2015, 09:00 (dates already fixed, see the calendar), Torre Archimede, Room 2BC/30 for the first two lectures; Room 1BC/50 for the others.

Examination and grading: Seminar and paper on a subject assigned by the Instructor.
ECTS: students attending the all course and passing the final exam will earn 1 ETCS.

SSD: INF/01 Computer Science

Expected Participants: The course will be open to all interested students, particularly PhD students from University of Padua for the PhD course in Brain, Mind and Computer Science. We believe the course will be of interest also for students from PhD School in Mathematics and Engineering, as well as for MSc students in Computer Science, Psicology, Mathematics, and Computer Engineering.

Aim: The purpose of this course is to familiarise participants with threats, vulnerabilities, and security countermeasures of existing and upcoming wireless systems. The topics include a wide range of both mainstream wireless technologies and the security problems of emerging wireless technologies, such as future airtraffic communication networks.

Course contents:

- Wireless Communication Overview: Wireless Channel and Signal Propagation
- Risks and Threats of Wireless: Passive and Active Threat Model, Cryptography Primer
- System Performance vs. Security Tradeoffs
- Antijamming/Jammingresistance
- Security of Cellular Networks: GSM and UMTS Architectures
- Security of Wireless Sensor Networks (WSNs)
- Security of Future Airtraffic communication networks (ADSB Protocol)

Lab Practicals:

- Capturing and Analysing Wireless Communication: IEEE 802.11/WiFi Networks
- Location Validation using Received Signal Strength and Time Difference of Arrival
- Receiving and processing ADSB Traffic using OffTheShelf Hardware