Advanced digital communications

Finalità
The course is monographic, focused on topics of current scientific relevance, which can change from year to year. For the academic year 2004/2005, the course will be based on the following topic: ad hoc wireless networks.

Programma
First part: chacterization of wireless channels. Wireless local area networks: standard IEEE 802.11. Theoretical analysis of access schemes in centralized wireless networks. Picocellular networks: standard Bluetooth and applications. Concepts of queueing theory. Circuit and packet switching.

Second part: ad hoc (decentralized) wireless networks. Transport capacity. Cross-layer analysis of ad hoc wireless networks: connectivity, effective transport capacity, spatial energy density, time-discrete equivalent models. Wireless sensor networks.

Teaching Rules

Theoric lectures and assignment of techical papers and problems to the students. In the second part of the course the students will start to work, in small groups, to projects with a final relation to submit. The projects will of two main types: analytical and simulation-based.

Modalità d'esame
Development of a group project with final relation to decide with the teacher. During the course there might be intermediate exams regarding part of the topics treated in class.

Propedeuticità
Esami di matematica, Reti di Telecomunicazioni A e B, Trasmissione Numerica

Testi consigliati
Handouts from the teacher.