Course name:	**Wireless Communications**
Abbreviation / number	WLC / 5904 Version: 21.06.2019
Degree program:	Elektrotechnik (M. Sc.)
Semester:	second semester
Frequency of the offer:	Summer term
Responsible lecturer:	Prof. Dr.-Ing. Uwe Meier
Lecturers:	Prof. Dr.-Ing. Uwe Meier
Language:	English
Relation to curriculum:	Compulsory optional subject
Teaching type / hours:	Lecture / 3 hours per week, Exercise or lab / 1 hour per week
Students' workload:	150 hours = 60 hours confrontation time (lectures, exercises, and labs) plus 90 hours additional student individual work/homework time
ECTS credits:	5
Prerequisites:	Signals and linear systems, basics of modulation, basics of random processes
Goals:	Students acquire system-theoretical knowledge of the physical and MAC layer of modern radio systems. They are able to determine and to model real propagation channel characteristics. They can assess the performance limits of wireless systems including modulation and channel coding. They learn how to use appropriate simulation and network planning tools in order to predict the quality and the limitations of wireless radio systems. After completion of the course, students are able to critically analyze wireless system problems and create appropriate solutions.
Contents:	Mobile radio channels (multipath propagation, Doppler effects, Bello functions, channel measurements and characterization, channel modeling) Advanced modulation methods (theoretical limitations, spread spectrum systems, multicarrier systems, ultra-wide band radio) Channel coding including space-time codes, MIMO (multiple input - multiple output) systems Further topics: Software-defined radio (SDR), cognitive radio systems, coexistence management
Examination:	Oral examination
Teaching media:	Projector / charts, blackboard, lab equipment, simulation software
Literature:	Script, exercise problems and lab tasks for downloading Haykin, Simon, and Michael Moher: Modern Wireless Communications. Pearson-Prentice Hall. Pahlavan, K., and A.H. Levesque: Wireless Information Networks. Wiley. Paulraj, A., R. Nabar, and D. Gore: Introduction to Space-Time Wireless Communications. Cambridge UP. Rappaport, T. S.: Wireless Communications, Principles and Practice. Prentice Hall.