

Specification for the book of courses

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|---|--|---|--------------------------------|----------------------|
| Study program | | Electrical Engineering and Computer Science | | |
| Module | | Common | | |
| Type and level of studies | | Doctoral studies | | |
| The name of the course | | RF Integrated Circuits | | |
| Lecturer (for lectures) | | Jovanović S. Goran | | |
| Lecturer/associate (for exercises) | | | | |
| Lecturer/associate (for OFE) | | | | |
| Number of ECTS | 10 | Course status (obligatory/elective) | Elective | |
| Prerequisites | | | | |
| Course objectives | | | | |
| Introduction to technology of RF integrated circuits production, design flow and verification. Description of the process for measuring and testing the fabricated integrated circuits. Introducing to RF designers job in a standard working environment. Usage of specialized software tools for RF circuit design. | | | | |
| Course outcomes | | | | |
| Students need to acquire theoretical and practical knowledge that is necessary for realization of complex RF circuits on-chip. | | | | |
| Course outline | | | | |
| Theoretical teaching | | | | |
| BiCMOS technology for RF and analog circuits. Design kit, installation, design rules, the most important parameters. Library elements, schematic symbols, simulation models, the layout. Library cells. Creation of new cell. Layout drawing. Pad in RF integrated circuits, bonding, chip packaging. Wires on a chip as matching networks elements and microstrip filters. Electromagnetic simulation of the layout. Equivalent reflection layout parameters. Layout vs. schematic verification (LVS). Design rules check (DRC). Design simulation. GDSII format. Fabrication. | | | | |
| Practical teaching (exercises, OFE, study and research) | | | | |
| Design examples: low-noise amplifiers, mixers, oscillators, PLL circuits. | | | | |
| Textbooks/references | | | | |
| 1 | Benzad Razavi, RF Microelectronics, Second Edition, Prentice Hall, 2012. | | | |
| 2 | R. Gilmore and L. Besser, Practical RF Circuit Design for Modern Wireless Systems, Artech House, Boston, 2003. | | | |
| 3 | R. Ludwig, P. Bretchko, RF Circuit Design: Theory and Applications, Prentice Hall, 2000. | | | |
| 4 | | | | |
| 5 | | | | |
| Number of classes of active education per week during semester/trimester/year | | | | |
| Lectures | Exercises | OFE | Study and research work | Other classes |
| 3 | 0 | 0 | 0 | 0 |
| Teaching methods | | | | |
| Lectures, exercises, consultations. | | | | |
| Grade (maximum number of points 100) | | | | |
| Pre-exam duties | | Points | Final exam | Points |
| Activity during lectures | | | Written exam | |
| Exercises | | | Oral exam | 50 |
| Colloquia | | | | |
| Projects | | 50 | | |