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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering, Niš |
| **GENERAL INFORMATION** |
| Study program  | Telecommunications |
| Study Module (if applicable) | Telecommunications and Signal Processing, Radiocommunication Engineering and Technologies |
| Course title | Distributed Embedded Systems |
| Level of study | ☐ Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory ☐ Elective |
| Semester  |  ☐ Autumn ☐ Spring |
| Year of study  | I |
| Number of ECTS allocated | 4 |
| Name of lecturer/lecturers | Đorđević Lj. Goran, Stojcev K. Mile |
| Teaching mode |  ☐Lectures ☐Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The goal of the course is for the student to gain understanding and knowledge of communication and networks in embedded systems, particularly essential concepts and methods used in wireless sensor networks and radio-frequency identification (RFID) systems;After successful completion of this course, students are expected to be able to: а) understand the generic design, analysis, and implementation of distributed embedded systems, b) develop realistic wireless sensor network applications under operating system such as TinyOS. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Wireless sensor networks: application areas and examples, common characteristics, and challenges; sensor node architecture: sensing, processing, communication and power supply subsystems; network architecture: classification, optimization goals, and design principles; communication protocols: physical layer: wireless channel and transceiver design considerations; medium access protocols: contention-based, schedule-based and multi-channel protocols, 802.15.4 and ZigBee; routing protocols: flooding and gossiping, data-centric, proactive, on-demand, and location-based routing; time synchronization protocols; localization: rage-free and rage-based localization; sensor network programming: operating systems (TinyOS) and languages (nesC). Radio frequency identification (RFID): classification, standards, and regulative; physical and link layer specifications (coupling, frequencies, encoding, modulation, and anti-collision protocols), application areas. |
| **LANGUAGE OF INSTRUCTION** |
| ☐Serbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **10** | **Written examination** | **30** |
| **Practical teaching** | **10** | **Oral examination** | **20** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |