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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electrical Engineering |
| **GENERAL INFORMATION** |
| Study program  | Electronics and Microsystems |
| Study Module (if applicable) | Electronics |
| Course title | Broadband access networks |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [x]  Obligatory [ ]  Elective |
| Semester  |  [x]  Autumn [ ] Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Dončov S. Nebojša |
| Teaching mode |  [x] Lectures [ ] Group tutorials [ ]  Individual tutorials [x] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Acquisition of basic knowledge of access technologies for distribution of broadband interactive services. Getting familiar with possible types and architectures of broadband access networks and standards and recommendations. Knowledge of the main characteristics of broadband access technologies. Ability to choose the optimal architecture of access network for an efficient distribution of broadband interactive services. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| General model of access network. Review of transmission media characteristics. Standards and recommendations. Broadband access technology over telecommunication cables with symmetric pairs. Symmetric and asymmetric xDSL access technologies (HDSL, SHDSL, ADSL2+, VDSL). Devices for broadband access (splitters, IP-DSLAM, xDSL modems). Fiber in the loop (FITL). Topologies of optical access networks. Passive and active optical networks in the local loop (BPON, GPON, EPON, AON). DWDM systems. Combined technologies in access networks. Modernization of cable distribution system by using hybrid networks with optical and coaxial cables (HFC network). Bi-directional signal transmission and services (cable TV, internet, video on demand, voice transmission). Cable modem terminal system (CMTS). Cable modems. Broadband access over power lines. PLC access network via low-voltage power lines (basic elements: PLC base station modem, repeater, gateway). In-home PLC networks. Wireless local loop. Fixed and mobile wireless access. Broadband wireless access technologies (WLAN, UWB, Wi-Max). Multiservice access node (MSAN). Practical work with measuring instruments for the characterization of access networks at the physical level and IP level. |
| **LANGUAGE OF INSTRUCTION** |
| [ ] Serbian (complete course) [x]  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** | **5** | **Written examination** | **20** |
| **Practical teaching** | **20** | **Oral examination** | **20** |
| **Teaching colloquia** | **35** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |