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| **UNIVERSITY OF NIŠ** | | | | | | |
| **Course Unit Descriptor** | | **Faculty** | | | Faculty of Electronic Engineering | |
| **GENERAL INFORMATION** | | | | | | |
| Study program | | | | Electrical Engineering and Computing | | |
| Study Module (if applicable) | | | | Control Systems | | |
| Course title | | | | Predictive Control | | |
| Level of study | | | | ☐Bachelor ☐ Master’s ⊠ Doctoral | | |
| Type of course | | | | ☐ Obligatory ⊠ Elective | | |
| Semester | | | | ⊠ Autumn ⊠ Spring | | |
| Year of study | | | | Second | | |
| Number of ECTS allocated | | | | 10 | | |
| Name of lecturer/lecturers | | | | Mitić B. Darko | | |
| Teaching mode | | | | ⊠Lectures ☐Group tutorials ☐ Individual tutorials  ☐Laboratory work ☐ Project work ☐ Seminar  ☐Distance learning ☐ Blended learning ⊠ Other | | |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** | | | | | | |
| The purpose of the course is to provide a comprehensive knowledge of the theory of model predictive control (MPC). | | | | | | |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** | | | | | | |
| Robust model predictive control. Types of uncertainty. Feedback versus open-loop control. Nominal robustness. Robust MPC design of nonlinear systems. State estimation. Moving horizon estimation (MHE). Extended Kalman filtering. Particle filtering. Combined MHE/particle filtering. Output MPC. Linear constrained systems. Offset-free MPC. Nonlinear constrained systems. Distributed MPC (DMPC). Introduction and consideration of the existing results. Unconstrained two-player game. Constrained two-player game. Constrained M-player game. Nonlinear DMPC. Explicit control laws for constrained linear systems. | | | | | | |
| **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** | **0** | | **Written examination** | | | **0** |
| **Practical teaching** | **0** | | **Oral examination** | | | **50** |
| **Project** | **50** | | **OVERALL SUM** | | | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** | | | | | | |