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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering |
| **GENERAL INFORMATION** |
| Study program  | **Computing and Informatics** |
| Study Module (if applicable) | Computer Engineering |
| Course title | 3D Graphics Pipelines |
| Level of study | [ ] Bachelor [x]  Master’s [ ]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [x]  Autumn [ ] Spring |
| Year of study  | 1 |
| Number of ECTS allocated | 4 |
| Name of lecturer/lecturers | Dejan D. Rančić, Aleksandar Lj. Milosavljević |
| Teaching mode |  [x] Lectures [x] Group tutorials [ ]  Individual tutorials [ ] Laboratory work [x]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduction to 3D graphics pipelines, their programmable stages and programming. Theoretical and practical knowledge in programming 3D graphics pipelines, and implementation skills using OpenGL API.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Architecture of modern graphics processors (GPUs). Programming GPUs (shaders, kernels, GLSL, OpenCL, CUDA). 3D pipelines (programmable and fixed stages). CPU-GPU communication. Vertex processing. Transform feedback. Tessellation. Geometry processing. Clipping and rasterization. Fragment processing. Fragments fetching. Non-graphical calculations. Synchronization and interoperability. Debugging and profiling.** |
| **LANGUAGE OF INSTRUCTION** |
| [x] 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** | **20** | **Written examination** |  |
| **Practical teaching** |  | **Oral examination** | **40** |
| **Teaching colloquia** | **40** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |