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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Sciences and Mathematics |
| **GENERAL INFORMATION** |
| Study program  | **Computer Science** |
| Study Module (if applicable) | Software development / Information processing |
| Course title | Theory of programming languages |
| 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 |  |
| Name of lecturer/lecturers | dr Marko Petković |
| 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)** |
| *The purpose of this course is to systematize the basic concepts in modern programming languages and to introduce students with the language C# and .NET framework. This course will review and endepth foundamental concepts in object-oriented programming, including their implementation in (for students a new) programming language C#. It will also provide the comparison of these features in C# and in some of today's most popular programming languages including Java and CPP. The second part of the course is dedicated to the introduction of foundamental concepts of .NET framework and Windows applications development, including Windows kernel functions, database interaction and development, sockets, web services, etc.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **History and development of programming languages:** Formal description of programming languages. Review of today’s most popular languages including CPP and JAVA. Namespace structure and .NET architecture.**Elements of procedural and OO programing in C#:** procedural programming, foundaments of OO programming, inheritance, interfaces, indexers, references, memory organization, garbage collector, generic classes (comparsion with templates in CPP), covariant and contravariant interfaces, collections, arrays, operator overloading, combination of C# and CPP.**Foundamental classes of .NET framework:** IO operations, LINQ and functional programming, multithreading, system registy classes, sockets.**Windows desktop programming:** Forms, basic controls, delegates and events, main and context menu, WPF (Windows Presentation Foundation) applications, XAML language, WPF components.Database interaction: .NET framework classes for database interaction, foundaments of MSSQL databases, SSDT, LINQ to SQL, Entity Framework.**Further topics:** ASP.NET (MVC), WCF (Windows Communication Foundation) and web services, RegEx (Regular Expressions).  |
| **LANGUAGE OF INSTRUCTION** |
| [x] 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** | **0** | **Written examination** |  |
| **Practical teaching** | **0** | **Practical project** | **50** |
| **Teaching colloquia** | **50 (25+25)** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |