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| **UNIVERSITY OF NIŠ** | | | | | | | | |
| **Course Unit Descriptor** | | | **Faculty** | | Faculty of Mechanical Engineering | | | |
| **GENERAL INFORMATION** | | | | | | | | |
| Study Program | **Mechanical Engineering** | | | | | | | |
| Study Module (if applicable) | - | | | | | | | |
| Course Title | Mathematics 3 | | | | | | | |
| Level of Study | ☒Bachelor | | | ☐ Master’s | | | | ☐ Doctoral |
| Type of Course | ☒ Obligatory | | | ☐ Elective | | | | |
| Semester | ☒ Autumn | | | ☐ Spring | | | | |
| Year of Study | I | | | | | | | |
| Number of ECTS Allocated | 7 | | | | | | | |
| Name of Lecturer/Lecturers | Predrag M. Rajković | | | | | | | |
| Teaching Mode | ☒ Lectures | | | ☒ Group tutorials | | | | ☐ Individual tutorials |
| ☐ Laboratory work | | | ☐ Project work | | | | ☒ Seminar |
| ☐ Distance learning | | | ☐ Blended learning | | | | ☐ Other |
| **Purpose and Overview (max. 5 sentences)** | | | | | | | | |
| *This is a course which gives an introduction to high level mathematics with emphasis on concepts, their qualitative aspects and applications. The main topics are: infinite series, partial differential equations, complex analysis and Laplace transform* intended for students in the technical sciences*.* | | | | | | | | |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** | | | | | | | | |
| **Series.** Real series. Convergence. A functional arrays and series. Power series. Expansions. Trigonometric and Fourier series.  **Complex analysis**. Complex numbers, sets and functions. Limits and continuous functions. Derivative. Cauchy- Riman conditions and analytical functions. Conformal mapping. Integrals of complex functions. Taylor and Laurent series. Residue.  **Differential equations** (DE). Classification of DE. The characteristic equation. DE of high order. The method of variation of parameters . Systems of DE. Equivalence of a system DE and a high order DE. The first integrals. Symmetric systems of DE. Partial DE. Kinds od solutions. Homogeneous and nonhomogeneous equation.  **Laplace transform.** The existence and basic properties. Laplace transforms of elementary functions, derivatives and integrals. Convolution. The basic Laplace table. The inverse Laplace transform. Application to the differential equations.  **Theory of vector fields**. Operators: gradient, divergence and rotor. Theorems of Gauss and Stokes. | | | | | | | | |
| **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** | | | **60 (depending on Teaching Colloquia)** | | |
| **Practical Teaching** | | **0** | **Oral Examination** | | | **30** | | |
| **Teaching Colloquia** | | **60** | **Overall Sum** | | | **100** | | |
| **\*Final examination mark is formed in accordance with the Institutional documents** | | | | | | | | |