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**			