UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION	
Study Program	Energy and Process Engineering
Study Module (if applicable)	-
Course Title	Numerical Simulations in Energy and Process Engineering
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	Gradimir S. Ilić, Predrag M. Živković, Miloš M. Jovanović, Mića V. Vukić
Teaching Mode	☒ Lectures ☐ Group tutorials ☐ Individual tutorials ☐ Laboratory work ☒ Project work ☐ Seminar ☐ Distance learning ☐ Blended learning ☐ Other

Purpose and Overview (max. 5 sentences)

Introducing students to the basic principles of numerical solving of heat and mass transfer problems in energy and process engineering.

Syllabus (brief outline and summary of topics, max. 10 sentences)

1) Heat and mass transfer conservation equations. Initial and boundary conditions. 2) General transport equation. 3) Finite difference method for convective-diffusion problems. 4) Finite volume method for diffusion problems. 5) Finite volume method for convective-diffusion problems. Steady 1D convection-diffusion. 6) Discretization scheme properties: Conservativeness, Boundedness, Transportiveness, Accuracy. 7) Central difference scheme and application. 8) Upwind difference scheme and application. 9) Hybrid difference scheme and application. 10) Higher order difference schemes and stability problems. 11) Solution algorithms for discretized equations. Tri-diagonal matrix algorithm. 12) SIMPLE algorithm.

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	**5**	**Written Examination**	- (or max 70 depending on Pre exam Duties)

Practical Teaching	**5**	**Oral Examination**	**Max. 30**
Project work	**60**	**Overall Sum**	**100**
***Final examination mark is formed in accordance with the Institutional documents**			