UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION	
Study Program	Mechanical Engineering
Study Module (if applicable)	-
Course Title	Energy and Exergy Analysis 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	10
Name of Lecturer/Lecturers	Gradimir S. Ilić, Dejan M. Mitrović
Teaching Mode	☒ Lectures ☐ Group tutorials ☐ Individual tutorials ☐ Laboratory work ☐ Project work ☐ Seminar ☐ Distance learning ☐ Blended learning ☐ Other

Purpose and Overview (max. 5 sentences)

To introduce students to the: analyses based on the second law of thermodynamics; principles of exergy analysis; mechanisms of entropy generation and exergy destruction during heat transfer, fluid flow, mixing, chemical processes and other thermo-fluid processes and exergo-economics.

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

Analysis based on the second law of thermodynamics; The concept of entropy and negentropy; The entropy of the environment; Criteria of spontaneous processes; The mass, energy and entropy balances for open thermodynamic systems; Exergy analysis of processes; The concept of exergy; Concept and models of environment in defining the exergy; Gouy-Stodola theorem; Exergy destruction of thermodynamic cycles and systems; Mechanisms of entropy generation and exergy destruction during heat transfer, fluid flow, mixing, chemical processes and other thermo-fluid processes; Analysis of thermal flow processes with exergy methods and tools; Overall principles of exergy analysis; Integration of processes by error elimination method based on second law of thermodynamics; Thermal and exergo-economics; Definition and objectives of exergoeconomics; Costs of energy and exergy losses; Exergeconomic optimization procedure for energy systems; Method of entropy generation minimization.

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	-	Written Examination	-
Practical Work	70	Oral Examination	Max. 30
Teaching Colloquia or Seminar	-	Overall Sum	100
*Final examination mark is formed in accordance with the Institutional documents			