UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION			
Study Program	Mechanical Engineering		
Study Module (if applicable)	-		
Course Title	Thermodynamics		
Level of Study	☒Bachelor	☐ Master's	☐ Doctoral
Type of Course	☒ Obligatory	☐ Elective	
Semester	☐ Autumn	☒ Spring	
Year of Study	II		
Number of ECTS Allocated	7		
Name of Lecturer/Lecturers	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)

Introduce students to the principles and limitations of thermal energy transformation. Practical applications. Mechanisms of heat transfer.

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

1) Introductory concepts and definitions. Describing thermodynamic systems and their behaviour. Ideal gas model. (p–v–T) relation. 2) Ideal gas mixtures. (p–v–T) relation for ideal gas mixtures. 3) Energy and the first law of thermodynamics. Internal energy and specific heat of ideal gases. Work and heat. Energy transfer by heat. Energy balance for closed systems. (p,v) diagram. 4) Open thermodynamic systems. Kinetic energy. Potential energy. Enthalpy. Steady-state flow processes. Conservation of mass for a control volume and conservation of energy for a control volume. 5) Polytropic and other process of an ideal gas. Thermodynamic cycle. 6) Introducing entropy and the second law of thermodynamics. 7) (T,s) diagram. Defining entropy change. Heat transfer and work in internally reversible. 8) Isentropic processes. Isentropic efficiencies. 9) Real gasses. Steam power systems. Analyzing steam power systems – Rankin's cycle. Other cycles. Refrigeration and heat pump cycles. 10) Energy transfer. Conduction. Fourier's law. 11) Convection. Newton's law. 12) Thermal radiation. Stefan–Boltzmann's law.

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**	**0** (or max 60 depending on Pre exam Duties)
Practical Teaching	**15**	**Oral Examination**	**Max. 30** (depending on Teaching Colloquia)
Teaching Colloquia	**50**	**Overall Sum**	**100**
***Final examination mark is formed in accordance with the Institutional documents**			