UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION			
Study Program	Mechanical Engineering		
Study Module (if applicable)	-		
Course Title	Turbomachinery basics		
Level of Study	☒Bachelor	☐ Master's	☐ Doctoral
Type of Course	☐ Obligatory	☒ Elective	
Semester	☒ Autumn	☐ Spring	
Year of Study	III		
Number of ECTS Allocated	6		
Name of Lecturer/Lecturers	Dragica R. Milenković		
Teaching Mode	☒ Lectures ☒ Laboratory work ☐ Distance learning	☐ Group tutorials ☐ Project work ☐ Blended learning	☐ Individual tutorials ☐ Seminar ☐ Other

Purpose and Overview (max. 5 sentences)

The aim of the course is to introduce all students with different types of turbomachinery, basic principles of their operation, and working characteristics. The course is targeting both the theoretical and practical aspects of the turbomachinery.

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

1) Introduction. Definitions. Work principles. Turbomachinery historical development. 2) The thermodynamic base. State variables. Change of state variables in turbomachines. Multistage processes. 3) The flow through the turbomachines and the process of energy exchange. Unit work. 4) Momentum law. Impeller work. Euler equations. 5) Cavitation and suction head - NPSH, (pumps and water turbines). 6) Working characteristics of turbomachines. 7) Power and efficiency of hydraulic and thermal turbomachinery. 8) Similarity law. Coefficients of unit work and flow, specific frequency. 9) Duty points. Working curves of turbomachines. The theoretical and experimental determination of working curves. 10) Series and parallel coupling of pumps and fans of the same and different characteristics. 11) Control of pumps, fans and turbo-compressors. 12) Control options: change the characteristics of the pipeline, frequency control, bypass control, blades angle control of axial turbomachinery 13) unstable operation of turbomachinery.

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
Lecture (participation)	5	Written Examination	0* (50)
Homework	10	Oral Examination	Max. 35
Two midterm exams	50	Overall Sum	100
* Refers to students who have already gained points by completing pre-exam requirements			