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| **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 | | | ☐ Group tutorials | | | | ☐ Individual tutorials |
| ☒ Laboratory work | | | ☐ Project work | | | | ☐ Seminar |
| ☐ Distance learning | | | ☐ Blended learning | | | | ☐ 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** | | | | | | | | |