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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 | Selected Topics in Refrigeration Devices and Heat Pumps |
| Level of Study | ☐Bachelor | ☐ Master’s | ☒ Doctoral |
| Type of Course | ☐ Obligatory | ☒ Elective |
| Semester | ☒ Autumn | ☐ Spring |
| Year of Study | II |
| Number of ECTS Allocated | 10 |
| Name of Lecturer/Lecturers | Bratislav D. Blagojević |
| Teaching Mode | ☒ Lectures | ☒ Group tutorials | ☒ Individual tutorials |
| ☐ Laboratory work | ☐ Project work | ☒ Seminar |
| ☐ Distance learning | ☐ Blended learning | ☐ Other |
| **Purpose and Overview (max. 5 sentences)** |
| *Expanding students’ knowledge related to the application of refrigeration devices in industrial cooling systems, unconventional cooling systems as well as to the application of heat pumps in energy systems.**Making students capable of mathematical modelling, simulation and optimization of energy systems with refrigeration and heat pumps, as well as for using appropriate software tools. Students get knowledge on refrigeration devices and heat pumps required for their application and estimation of energy efficiency improvements and environmental impact reduction possibilities, as well as competences for self-driven scientific and research work, including completion of the doctoral dissertation.* |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** |
| (1) Absorption refrigeration. (2) Industrial refrigeration. (3) Refrigeration devices in poligeneration systems. (4) Unconventional systems. (5) Heat pumps with use of energy from environment. Heat pumps with use of waste energy. Integration of heat pumps into district heating systems. (6) Energy consumption of cooling systems. (7) Energy efficiency improvements and environmental impact reduction. (8) Software solutions for refrigeration devices synthesis and simulation. (9) Combined heating and cooling systems energy performance modelling. (10) Environmental parameters evaluation methodology for cooling systems. |
| **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** |
|  |  | **Overall Sum** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |