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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 | Numerical simulation of fluid flow | | | | | | | |
| 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 | dr Zivan Spasić, dr Jasmina B. Bogdanović-Jovanović | | | | | | | |
| Teaching Mode | ☒ Lectures | | | ☐ Group tutorials | | | | ☐ Individual tutorials |
| ☐ Laboratory work | | | ☒ Project work | | | | ☒ Seminar |
| ☐ Distance learning | | | ☐ Blended learning | | | | ☐ Other |
| **Purpose and Overview (max. 5 sentences)** | | | | | | | | |
| *Students should acquire knowledge in theory of fluid flow through profile cascades, acquiring skills in the methodology of modelling and numerical solving of flow through the profile cascades, using appropriate software.*  *The main aim is enabling students to formulate independently and on scientific principles, models of flow through straight and circular profile cascades.* | | | | | | | | |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** | | | | | | | | |
| *1) Types of turbomachinery cascades and their roles in flow modeling. 2)Direct and indirect task of the theory of flow through the turbomachinery cascades. 3) The schematization of flow through the cascades. 4) One-dimension flow model. 5) Two-dimension flow model. 6) Flow through the axial-flow profile cascades. 7) Flow through the radial profile cascades. 8) Model of two mutually dependent two-dimensional flow. 9) The flow averaging to the circular component and calculation of flow in the meridional surface. 10) Calculation of flow according to the axisymmetrical flow surfaces 11) Three-dimension flow model. 12) Averaged Navier-Stokes equations for turbulent flow and constitutive (additional) equations. 13) Numerical solution of the flow equations using adequate CFD softwares.* | | | | | | | | |
| **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** | | | **Max 40, depending on Teaching Colloquia** | | |
| **Practical Teaching** | | **5** | **Oral Examination** | | | **50** | | |
| **Teaching Colloquia** | | **40** | **Overall Sum** | | | **100** | | |
| **\*Final examination mark is formed in accordance with the Institutional documents** | | | | | | | | |