|  |
| --- |
| **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | Faculty of Mechanical Engineering |
| **GENERAL INFORMATION** |
| Study Program | **Mechanical Engineering** |
| Study Module (if applicable) | - |
| Course Title | Thermal Measurements |
| 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 | Gradimir S. Ilić , Predrag M. Živković |
| 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 methods of measuring of micro, macro and integral fluid flow and parameters.* |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** |
| Parameters defining fluid flow: macro-flow parameters (pressure, temperature, flow velocity...); micro flow parameters (turbulent intensity, Reynolds stresses, turbulent momentums...); integral flow parameters (heat and mass flow...); counters. Measuring transducers. Static and dynamic properties of measuring transducers. Resistant-strain gauges; capacitive, inductive, induction, photoelectric gauges. Flow pressure measurements. Static and dynamic flow pressure. Pressure gauges. Flow velocity measurements. Pitot and Pitot-Prandtl tube. Cylindrical tube. Hot wire anemometry. CTA hot wire system for measurement of the flow velocity and turbulent intensity. Laser-Doppler anemometry. Doppler shift.Flow measurement and counters. Dumping elements (0rifices, nozzles, sleeves, Venturi tube). Flow temperature measurements. Static and dynamic temperatures. Temperature sensors. Optical methods (Schlieren, Shadowgraph, Mach-Zender, Particle image velocimetry...). Optic and radiation pyrometers. Thermocouple thermometry. Moisture measurement. Psychrometric method. Sensitivity equations. Flow composition measurements. Gas analysers. |
| **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** | **10** | **Written Examination** | **0** |
| **Practical Teaching** | **15** | **Oral Examination** | **50** |
| **Seminar** | **25** | **Overall Sum** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |