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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Occupational Safety in Niš |
| **GENERAL INFORMATION** |
| Study program  | Environmental Protection |
| Study Module (if applicable) | / |
| Course title | Electrotechnics |
| Level of study | ☒Bachelor ☐ Master’s ☐ Doctoral |
| Type of course | ☒ Obligatory ☐ Elective |
| Semester  | ☒ Autumn ☐Spring |
| Year of study  | II |
| Number of ECTS allocated | 6 |
| Name of lecturer/lecturers | Dejan Petković, Dejan Krstić |
| Teaching mode |  ☒Lectures ☐ Group tutorials ☒ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Acquisition of knowledge about basic terms and laws in electrotechnics and ability to take specialized courses in the later years of study.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| **Electrostatics: Charge, Coulomb’s Law, Electric field, Gauss’s Law, Electric potential, LaPlace’s and Poisson’s equations, Capacitance and capacitors, Dipole and multipoles, The image theorem, Conductors and dielectrics, Electrostatic induction vector, Boundary conditions, Dielectric polarisation, Bound charges, Electrostatic field energy, Principle of static charge elimination. Stationary electric field and direct current: Charge carriers, Current density and intensity, Charge continuity equation and Kirchhoff’s first law, Resistance and resistors, Ohm’s, Joule’s, and the second Kirchhoff’s Law, Capacitor in a direct current circuit, Generators, Maximum power transfer, Theorems and methods for solving electric circuits, Duality of electrostatic and stationary electrostatic field, Impulse ground resistance and grounding principles. Electromagnetism: Lorentz force, Magnetic induction, Hall effect, Magnetic field of stationary currents, Particle movement in electromagnetic field, Ampere’s Law, Magnetic vector potential, Circular current contour, solenoid, torus, Material magnetizing, Boundary conditions, Material division and hysteresis, Concept of magnetic pseudo‐mass and magnetic poles, Generalized Ampere’s Law, Electromagnetic induction and Faraday’s Law, Magnetic field energy, Inductance and induction coefficients, Mutual inductance and coupled circuits, Electrical oscillations, Direct and alternate current generator, Transformer, Variable electromagnetic field, Surface effect. Time‐variable current: Simple‐periodic currents, complex domain, and impedance, Resonant and anti‐resonant circuits, Solution of simple electric circuits in the time and the complex frequency domain.** |
| **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** | **25** |
| **Practical teaching** | **5** | **Oral examination** | **25** |
| **Teaching colloquia** | **20+20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |