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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Occupational Safety in Niš |
| **GENERAL INFORMATION** |
| Study program  | Environmental Engineering |
| Study Module (if applicable) | / |
| Course title | Noise Protection Systems Designing |
| Level of study | ☐ Bachelor ☐ Master’s ⌧ Doctoral |
| Type of course | ☐ Obligatory ⌧ Elective |
| Semester  | ☐ Autumn ⌧ Spring |
| Year of study  | Second year |
| Number of ECTS allocated | 10 |
| Name of lecturer/lecturers | Dragan Cvetković, Momir Praščević |
| Teaching mode |  ☐ Lectures ☐Group tutorials ⌧ Individual tutorials ☐ Laboratory work ⌧ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *The acquisition of scientific competence, academic qualifications and creative skills to solve specific problems in the living environment caused by noise sources through identification and characterization of sources and passive and active noise control. Learning outcome: students will gain knowledge and understanding of noise generation and characteristics of complex noise sources; knowledge, understanding and implementation of methods for analyzing, describing and predicting noise, measurement and analysis of noise, design of passive and active systems for noise protection.* |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Sources of noise: basic characteristics, interaction of solid structures and sound waves, sound generation, sound transmission into enclosed and open spaces. Models of noise sources: monopole, dipole, quadrupole, cylindrical source of noise. Noise propagation modelling: analytical techniques, models, software. Numerical methods: finite element method. Sound fields: one‐dimensional and three‐dimensional sound field, wave propagation in mobile media. Advanced measurement techniques: time domain analysis, frequency domain analysis, analog and digital signal analysis. Methods for the identification of noise sources: conventional methods in time domain and frequency domain, cepstral analysis, envelope analysis, sound intensity method, acoustic holography. Passive methods for noise control: partitions, booths, barriers, vibro‐ insulation materials, acoustic treatment of rooms, sound‐ absorbing materials. Active methods for noise control: active control of sound propagation in ducts, active control of radiation from vibrating structures, active control of sound propagation in enclosed spaces, active vibration isolation, barriers with active systems. Active systems with and without feedback. Design of passive and active systems for noise protection. |
| **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** | **-** |
| **Practical teaching** | **30** | **Oral examination** | **30** |
| **Project work** | **35** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |