

Specification for the book of courses

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|--|---|--|--------------------------------|----------------------|
| Study program | Electronics and Microsystems | | | |
| Module | Electronics and Microsystems | | | |
| Type and level of studies | Master studies | | | |
| The name of the course | Ultrasonic Technique | | | |
| Lecturer (for lectures) | Mančić D. Dragan | | | |
| Lecturer/associate (for exercises) | Jovanović D. Igor | | | |
| Lecturer/associate (for OFE) | Jovanović D. Igor | | | |
| Number of ECTS | 5 | Course status (obligatory/elective) | Elective | |
| Prerequisites | | | | |
| Course objectives | Acquiring the fundamental knowledge about ultrasonic technique, methods of realisation and practical applications of ultrasonic devices. | | | |
| Course outcomes | Theoretical knowledge on ultrasonic technique. Mastering the techniques of development, realisation and application of ultrasonic transducers and generators. | | | |
| Course outline | | | | |
| Theoretical teaching | Introduction to ultrasonic technique. Application areas of ultrasound. Theoretical aspects on application of ultrasound. Generation and propagation of ultrasonic waves. Ultrasonic waveguides and transducers. Detection and measurement of ultrasound. Nondestructive testing of materials. Application of ultrasound in signal processing and measurements. Ultrasound in medicine. Methods of ultrasonic scanning. Application of power ultrasound. | | | |
| Practical teaching (exercises, OFE, study and research) | Measurement of the parameters of piezoelectric ceramics. Construction and measurement of the parameters of ultrasonic sandwich transducers. Construction and measurement of the parameters of ultrasonic sonotrode. Ultrasonic generator. System for ultrasonic cleaning. | | | |
| Textbooks/references | | | | |
| 1 | M.Radmanovic, D.Mancic, "Design and modelling of power ultrasonics transducers", MP Interconsulting, Le Lockle, Switzerland, 2004. | | | |
| 2 | D.Ensminger, L.J.Bond, "Ultrasonics: Fundamentals, Technologies, and Applications", CRC Press, 2011. | | | |
| 3 | J.David, N.Cheeke, "Fundamentals and Applications of Ultrasonic Waves", CRC Press, 2012. | | | |
| 4 | D.Mancic, V.Paunovic, "Application of impedance spectroscopy for electrical characterization of La doped BaTiO ₃ -ceramics" (in Serbian), Faculty of Electronic Engineering Nis, Edition: Monographies, Nis, 2012. | | | |
| 5 | | | | |
| Number of classes of active education per week during semester/trimester/year | | | | |
| Lectures | Exercises | OFE | Study and research work | Other classes |
| 2 | 2 | 1 | | |
| Teaching methods | Lectures; Auditorial exercises; Laboratory exercises; Computer exercises; Consultations. | | | |
| Grade (maximum number of points 100) | | | | |
| Pre-exam duties | Points | Final exam | Points | |
| Activity during lectures | 10 | Written exam | 20 | |
| Exercises | 15 | Oral exam | 20 | |
| Colloquia | 20 | | | |
| Projects | 15 | | | |