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| Study program: Mechatronics, Engineering Management | | | |
| Type and level of studies: Undergraduate academic studies (first level of studies) | | | |
| Course unit: Mechanical elements | | | |
| Teacher in charge: Marko Popović | | | |
| Teaching assistant: Milan Marjanović | | | |
| Language of instruction: English | | | |
| ECTS: 6 | | | |
| Prerequisites: Technical mechanics, Technical drawing | | | |
| Semester: Summer Semester | | | |
| Course unit objective | | | |
| The aim of this course is to introduce students with theoretical basics, application, working principle, calculation, structural forms of machine elements, as well as choosing standard machine elements according to the given conditions. In this course, students will be introduced with the basic characteristics of mechanical elements, through the analysis of loads, stresses and deformations. Students will also acquire basic knowledge related to the calculation of the load-bearing capacity of machine elements, the calculation of the degree of safety, reliability, service lifetime and the analysis of possible damage and destruction of machine parts and machine elements. | | | |
| Learning outcomes of Course unit | | | |
| By studying this subject, students will gain a basic knowledge of design, calculation and verification, element selection from standards and the assembly of machine elements into complex machine structures, all based on conditions related to production and exploitation. The student will be able to check and to dimension machine parts, subassemblies and assemblies in relation to the required criteria (strength, stiffness, stresses, etc.). | | | |
| Course unit contents | | | |
| <i>Theoretical classes</i> | | | |
| Introduction. Machine elements standardization. Tolerances of machine parts and assemblies. Fundamentals of machine part calculations. Fasteners and joints. Gear wheels. Friction wheel drives. Belts. Chains. Shafts and rotating parts. Rolling bearings. Sliding bearings. Clutches and brakes. | | | |
| <i>Practical classes</i> | | | |
| Projects as a form of practical training covers the following areas: threaded fasteners, belt drives, gears, and shafts. | | | |
| Literature | | | |
| [1] J.A. Collins, H.R. Busby, G.H. Staab, "Mechanical Design of Machine Elements and Machines", 2 nd edition, The Ohio State University, John Wiley & Sons, USA, 2010. | | | |
| [2] R.L. Mott, "Machine Elements in Mechanical Design". 4 th edition in SI Units, Prentice Hall Pearson Education South Asia Pte Ltd, Singapore, 2006. | | | |
| [3] R.G. Budynas, J.K. Nisbett, Shingley's Mechanical Engineering Design", 9 th edition, McGraw Hill, USA, 2011. | | | |
| [4] A.C. Ugural, "Mechanical Design, An Integrated Approach", McGraw Hill, USA, 2004. | | | |
| [5] Jugović, Z., Popović, M., "Mechanical elements – MANUAL", Faculty of Technical Sciences, Cacak, 2012. | | | |
| [6] Jugović, Z., Popović, M., Marjanović, M., "Mechanical elements – MANUAL - Tests of knowledge", Faculty of Technical Sciences, Cacak, 2015. | | | |
| Number of active teaching hours | | | Other classes: 0 |
| Lectures: 2 | Practice: 2 | Other forms of classes: 0 | |
| Teaching methods | | | |
| Theoretical and practical classes, individual work (project) and final test. | | | |
| In the theoretical classes (lectures), students are introduced to the theoretical foundations necessary for understanding of matter and solving practical examples. In the practical classes, students acquire practical knowledge and skills, and introductions for completion of individual work (project). | | | |
| Evaluation of knowledge is done through the development of projects (seminars) and final test (during the examination period). Passed individual works are requirement for taking an exam. | | | |
| Examination methods (maximum 100 points) | | | |
| Exam prerequisites | No. of points: | Final exam | No. of points: |
| Student's activity during lectures | 4 | oral examination | |
| Practical classes/tests | 4 | written examination | 50 |
| Seminars/homework | 12 | | |
| Project | 30 | | |
| Other | | | |
| Grading system | | | |
| Grade | No. of points | Description | |
| 10 | 91-100 | Excellent | |

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| 9 | 81-90 | Exceptionally good |
| 8 | 71-80 | Very good |
| 7 | 61-70 | Good |
| 6 | 51-60 | Passing |
| 5 | less than 50 | Failing |