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| ***Title of the course:***  **Machine elements** | | ***NEPTUN-code:***  RKXGZ1ABNF | ***Weekly teaching hours:*** *l+cw*1+2 | ***Credit*:** 4  ***Exam type****:* tm |
| ***Course leader:***  Dr. Szabó Lóránt | | ***Position:*** | ***Required preliminary knowledge: -*** | |
|  | |  | **Time of the course:**  lecture: Monday – 08:00-08:45  labour: Monday – 08:55-10:35 (D.266) | |
| ***Curriculum:*** | | | | |
| With the development, sustainable growth, environmental protection, pollution reduction can be achieved by using new, lightweight materials with outstanding mechanical properties, composites. The new composite material, which is created by embedding components with different properties - reinforcing fiber structures in a matrix - contains the beneficial properties of the constituent materials. The use of glass fiber and especially carbon fiber reinforced composites in many areas with special demands can expect key, dynamic growth. | | | | |
| **Detailed description of the subject, timetable** | | | | |
| **Weeks** | **Topics of lectures and practices** | | | |
| 17.02. 2025. | 1. Lecture: Polymer, Composite technology | | | |
| 24.02. 2025. | 2. Lecture: Plastic technology | | | |
| 03. 003.2025. | 3.Lecture: Fiber, Fiber technology generally  Carbon fibers, Producton of Carbon fiber Properties of Carbon fibers | | | |
| 10. 103.2025. | 4.Lecture: Glass, Basalt fibers, Other Inorganic fibers,  High performence Organic fibers | | | |
| 17. 03.2025. | 5. Lecture: Fibers reinfoced Constructions | | | |
| 23.03.2025. | 6.Lecture: Fiber surface, sizing, matrix, core material | | | |
| 30. 03.2025. | 7.Lecture + Practice: Composite production  Production of composites, Winding, Pultrusion, FPP | | | |
| 07.04.2025. | 8.Lecture: Infusion, RTM (Mold making), Preform, Prepeg, Autoclav,  Hand lay-up, Spry-up, Injection molding, 3D printing, SMART | | | |
| 14. 04.2025. | 9. Lecture: Properties of composites | | | |
| 22.04. and 23.04.2025. | Holiday | | | |
| 28.04.2025.. | 10.Lecture + Practice: student lecture | | | |
| 05.05.2025. | 11.Lecture: Applications of composites  Aviation, defenses  Automotive, Road transportaton, Marine  (Electrification, Hydrogen drive)  Vessel, Tube, Cable | | | |
| 12.05. 2025. | 12.Lecture: Wind energy, Sports, Leisure & Recreation  Building & Civil Engineering, Equipment & Machinery  Other applications | | | |
| 19. 05.2025. | 13.Written test I. – theoretical + practical | | | |
| **Mid-term requirements** | | | | |
| **Participation in occupations:**  Compulsory | | | | |
| **Mid-terms, protocols, reports, etc.:**   * 1 Written tests (lectures + laboratory/practice work), min. 2 (pass) every test. * Student lecture | | | | |
| **The method of obtaining a signature / mid-term mark:**  Basis of marking: attendance at lectures and laboratory works,  Written tests min. = 1 (pass) in each tests (separately).  In case of mid-semester mark fail (1), correction opportunities are available according to STUDENT REQUIREMENTS SYSTEM OF ÓBUDA UNIVERSITY | | | | |
| ***Professional competencies:*** | | | | |
| Knowledge of general and specific mechanical, natural and social scientific principles, rules, relations, and procedures as required to pursue activities in the special field of application  Comprehensive knowledge of the basic features and interrelations of environmental elements and systems, as well as of the environmentally harmful substances affecting them.  Able to perform basic tests of the quantity and quality characteristics of environmental elements and systems by state-of-the-art measuring instruments; to draw up and implement measurement plans; and to evaluate data.  Open to professional cooperation with specialists related to their profession but involved in other areas. | | | | |
| ***Literature:*** | | | | |
| Composites World monthly magazine  Plastics Technology monthly magazine | | | | |
| Comment: | | | | |