**Basic principles of materials engineering (Ist Year of study, Ist SEMESTER)**

**Credit value (ECTS) 3**

**Course category**

Domain (Compulsory courses)

**Discipline Code:** A.EMIAIA.D.106

**Course holder**

**PhD. Lecturer Virgil VLAHIDIS**

**Discipline objectives (course and practical works)**

The aim of the course is to provide students with theoretical knowledge of the materials and semi-finished products used in the construction of agricultural and food industry machinery, as well as their processing methods.

The practical work aims to provide the students with practical knowledge on the recognition of materials and semi-finished products used in the construction of agricultural and food industry machinery and to acquire practical knowledge of some methods of materials processing.

**Contents (syllabus)**

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| **Course (Chapters/subchapters)** |
| **Overview of metals and alloys.**  |
| **Material properties**. Physical, chemical, mechanical and technological properties of materials.  |
| **Structure of metals and alloys** |
| **Iron-carbon alloys**. Cast iron and steel.  |
| **Non-ferrous metallic materials.** Non-ferrous metals and alloys. |
| **Non-metallic materials.** |
| **Heat treatments. Thermochemical treatments.** |
| **Metal casting.** |
| **Welding of metallic materials**. Welding processes.**Soldering of metallic materials**. Soldering processes. |
| **Processing metals and alloys by plastic deformation.** Plastic deformation processes. |
| **Chipping metal machining.** Chipping processes. |

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| **Practical works** |
| **Work safety rules**; correct working practices throughout the Mechanization Building.**General notions about materials**. Ferrous and non-ferrous metallic materials. |
| **Characteristics of metal prefabricated products and metal products** used in machinery production. |
| **Non-metallic materials** in the agri-food industry. |
| **Welding metallic materials**. |
| **Soldering metallic materials.** |
| **Chipping machining .** |
| **Final colloquium of knowledge evaluation** |

**References**

1. Bodea Marius, 2006, Course on Materials - Faculty of Materials and Environmental Engineering Technical University of Cluj Napoca; https://sim.utcluj.ro/stm/download/Alba/Curs11-12.ppt.

2. Chirilă C., - Elemente de ingineria materialelor - Note de curs.

3. Maria Rădulescu - Studiul metalelor -Editura Didactică și Pedagogică Bucharest 1982.

4. Strnad Gabriela, 2014-Tehnologia Materialelor I, Petru Maior University of Targu-Mures, online course: http://magnum.engineering.upm.ro/~gabriela.strnad.

**Evaluation**

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| **Evaluation form** | **Evaluation Methods** | **Percentage of the final grade** |
| Exam | Oral examination | 60% |
| Appreciation of the activity during the semester | Oral assessment during the semester, verification tests and final laboratory colloquium. | 40% |

**Contact**

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