**Syllabus**

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| **Basic data of the subject** |
| **Academic unit:** | **Faculty of Engineering and Informatics** |
| **Title of the subject:** | **Modern Engineering Materials** |
| **Level:** | **Master** |
| **Course Status:** | **Core** |
| **Year of studies:** | **I** |
| **Number of hours per week:** | **4** |
| **Value of Credits - ECTS:** | **6** |
| **Time / location:** |  |
| **Course lecturer:** | **Prof.Asoc.dr. Ferit Idrizi** |
| **Contact details:**  | **ferit.idrizi@ushaf.net** |
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| **Course Description** | *This course will equip students with knowledge of engineering materials in general with a special focus on modern (composite) materials used today in the industry.* |
| **Objectives of the course:** | *Through this subject students will identify and recognize advanced modern engineering materials and understand the features and performance of their parameters.* |
| **Expected learning outcomes:** | *Upon successful completion of this subject, student will be able to:** *Understand the mechanics of engineering materials*
* *analyse the physical and chemical properties of materials including metals, ceramics, polymers and their contents*
* *analyse the processes of obtaining these materials*
* *appreciate the possibilities of applying modern materials instead of traditional ones*
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| **Contribution to the student load (which must correspond with learning outcomes)** |
| **Activity** | **Hour** | **Day/Week** | **In total** |
| Lectures with lab tutorials  | 4 | 15 | 60 |
| Internship |   |   |   |
| Contacts with teacher / consultations | 2 | 4 | 8 |
| Field exercises |   |   |   |
| Midterm, seminars and projects. | 20  |   |  20 |
| Homework |   |   |   |
| Self-learning time student (at the library or at home) | 3 | 15 | 45 |
| Final preparation for the exam | 15 |  | 15 |
| Time spent on evaluation (tests, quiz and final exam) | 1 |  | 1 |
| Projects and presentations. | 1 |  | 1 |
| **Total** |  |  | **150** |
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| **Teaching methodology:** | *Lectures combined with practical and laboratory work* |
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| **Assessment methods:** | Assignment 50 %Final exam 50 % |
| **Literature** |
| **Basic Literature:**  | 1. N.Boshnjaku ,,NJOHURI MATERIALESH TË MAKINERISË”,
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| **Additional Literature:**  | 1. *Doc.Tahir Haxhiymeri, Ali Katragjini, Qiriako Leka, Shyqyri Meta ,,TEKNOLOGJIA E MATERIALEVE”, Tiranë*
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| **The ratio of theory and practice** | *60% theory with numerical exercises and 40% laboratory work.* |

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| **Designed learning plan** |
| **Week:** | **Lectures and exercises to be held** |
| **Week one:** | *Chemical bonding of materials* |
| **Week two:** | *crystalline and amorphous structures* |
| **Week three:** | *deformation, propagation of cracks and other destructive phenomena* |
| **Week four:** | *Chemical, thermal, optical and magnetic properties of materials* |
| **Week five:** | *Modern engineering materials* |
| **Week six:** | *Nanomaterials, composites and super-strength materials* |
| **Week seven:** | *Permanent magnetic materials* |
| **Week eight:** | *Super plates* |
| **Week nine:** | *Semiconductors* |
| **Week ten:** | *Smart materials* |
| **Week eleven:** | *Clean energy materials* |
| **Week twelve:** | *Clean energy materials* |
| **Week thirteen:** | *Polymers* |
| **Week fourteen:** | *Biomaterials* |
| **Week fifteen:** | *Summary of the subject and preparation for the exam* |

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| **Academic policies and rules of conduct** |
| *Regular attendance of lectures and exercises is necessary, as well as active participation with discussion and solution of tasks. Not impeding the progress required for learning using mobile phones turned off or in silent mode.* |