**Syllabus**

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| **Basic data of the subject** |
| **Academic unit:** | **Faculty of Engineering and Informatics** |
| **Title of the subject:** | **Reverse Engineering and rapid prototyping** |
| **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.As.dr. Rrahim Sejdiu** |
| **Contact details:**  | **Rrahim.Sejdiu @ushaf.net** |
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| **Course Description** | *This course will equip students with the knowledge and skills of recycling engineering in order to intervene in the design of existing products which work will end with the generation of its prototype.* |
| **Objectives of the course:** | *The objective of this course is to address the basics of methods and techniques to support engineering design processes, by focusing on the opportunities offered by Reverse Engineering and Rapid Printing. The subject will clarify the design stages and the circumstances in which Reverse Engineering and Rapid Printing are most useful. Students will have the opportunity to experiment directly using the available tools in a laboratory environment.* |
| **Expected learning outcomes:** | *Upon successful completion of this subject, student will be able to:** *gain insight into the opportunities offered by reverse engineering and rapid printing,*
* *understand the main differences, pros and cons of alternative technologies to design products that can be created by 3D printing devices*
* *grasp and analyse the production processes used for fabricating prototypes and components of products;*
* *identify the advantages and limitations of Reverse engineering and additive manufacturing processes in the overall design, manufacturing and industrial engineering context.*
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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 | 3 | 3 | 9 |
| Field exercises |   |   |   |
| Midterm, seminars and projects. | 20  |  |  20 |
| Homework |   |   |   |
| Self-learning time student (at the library or at home) | 4 | 15 | 60 |
| Final preparation for the exam |  |  |  |
| Time spent on evaluation (tests, quiz and final exam) |  |  |  |
| Projects and presentations. | 1 |  | 1 |
| **Total** |  |  | **150** |
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| **Teaching methodology:** | *Basic formal lectures, activity in class and in the laboratories* |
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| **Assessment methods:** | *Assignment 100%* |
| **Literature** |
| **Basic Literature:**  |  |
| **Additional Literature:**  |  |
| **Ratio between theory and practice** | *60% Theory* *40% Practical work* |

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| **Designed learning plan** |
| **Week:** | **Lectures and exercises to be held** |
| **Week one:** | *Introduction to New Product Development* |
| **Week two:** | *Duties of detailed design* |
| **Week three:** | *Design tools* |
| **Week four:** | *Turning Engineering* |
| **Week five:** | *Existing Technologies* |
| **Week six:** | *Introduction to Basic Principles of Additive Production* |
| **Week seven:** | *Rapid Prototype Generating Technologies* |
| **Week eight:** | *Rapid Prototype Generating Technologies* |
| **Week nine:** | *Stereolithography (SLA) and Modeling (FDM) Polymers of Metals and Other Materials* |
| **Week ten:** | *Stereolithography (SLA) and Modeling (FDM) Polymers of Metals and Other Materials* |
| **Week eleven:** | *Design for additive production* |
| **Week twelve:** | *Application of Turning Engineering* |
| **Week thirteen:** | *Fast Printing in Different Industrial Areas.* |
| **Week fourteen:** | *Fast Printing in Different Industrial Areas.* |
| **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.* |