

## SYLLABUS

Basic data of the subject	
<b>Faculty:</b>	<b>Faculty of Engineering and Informatics</b>
<b>Title of the subject:</b>	<b>Reverse Engineering and 3D Modeling</b>
<b>Level:</b>	<b>Bachelor</b>
<b>Course Status:</b>	<b>Core</b>
<b>Year of studies:</b>	<b>3</b>
<b>Number of hours per week:</b>	<b>3</b>
<b>Value of Credits - ECTS:</b>	<b>4</b>
<b>Time / location:</b>	
<b>Course lecturer:</b>	<b>Prof.As.dr. Rrahim Sejdiu</b>
<b>Contact details:</b>	<b>Rrahim.sejdiu @ushaf.net</b>
Course Description	
<b>Course Description</b>	<i>This course will equip students with the knowledge and skills of recycling engineering and 3D Modeling in order to intervene in the design of existing products which work will end with the generation of its prototype. Scanning 3D objects through the most advanced technologies, intervention (changing the shape according to their requirements).</i>
<b>Objectives of the course:</b>	<i>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. The student will use computer programs to get acquainted with the principles of 3-dimensional design. Projects include modeling objects, features, aesthetic concepts, and proportions in space using various programs (3dsMax, AutoCAD, Rhino, Inventor, Blender, Creo).</i>
<b>Expected learning outcomes:</b>	<p><i>After successful completion of this module, student will be able to:</i></p> <ul style="list-style-type: none"> <li><i>• understand the main differences, pros and cons of alternative technologies to design products that can be created by 3D printing devices</i></li> <li><i>• identify the advantages and limitations of Reverse engineering and additive manufacturing processes in the overall design, manufacturing and industrial engineering context</i></li> <li><i>• understand the additive production processes used for fabricating prototypes and components of products</i></li> <li><i>• model 3D objects by way of reverse engineering using computer programs.</i></li> </ul>
Contribution to the student load (which must correspond with learning outcomes)	

Activity	Hour	Day/Week	In total
Lectures with lab tutorials	3	15	45
Internship			
Contacts with teacher / consultations	1	3	3
Field exercises			
Midterm, seminars and projects.	15		15
Homework			
Self-learning time student (at the library or at home)	3	12	36
Final preparation for the exam			
Time spent on evaluation (tests, quiz and final exam)	2		2
Projects and presentations.	1		1
<b>Total</b>			<b>102</b>

<b>Teaching methodology:</b>	<i>Basic formal lectures, activity in class and in the laboratories</i>
------------------------------	---

<b>Assessment methods:</b>	<i>Course work: 50%, Exam 50%</i>
----------------------------	---------------------------------------

#### Literature

<b>Basic Literature:</b>	<i>1. Materials provided by course lecturer</i>
--------------------------	---

<b>Additional Literature:</b>	<i>2. Christopher Barnatt, 3D PRINTING  3. Samuel N. Bernier, Bertier Luyt, and Tatiana Reinhard DESIGN FOR 3D PRINTING  4. Raja, Vinesh, Fernandes, Kiran J. (Eds.), "Reverse Engineering: an Industrial Perspective", Springer  5. 3D Photorealistic Rendering: Interiors &amp; Exteriors with V-Ray and 3ds Max, Jamie Cardoso  6. Rafiq I. Noorani, "Rapid Prototyping: Principles and Applications", Wiley  7. HAMAD M.; AutoCAD 2019 3D Modeling,</i>
-------------------------------	---

#### Designed learning plan

Week:	Lectures and exercises to be held
<b>Week one:</b>	<i>Introduction to New Product Development</i>
<b>Week two:</b>	<i>Duties of detailed design and Design tools</i>
<b>Week three:</b>	<i>Reverse Engineering and Existing Technologies</i>
<b>Week four:</b>	<i>Introduction to Basic Principles of Additive Production</i>
<b>Week five:</b>	<i>Rapid Prototype Generating Technologies</i>
<b>Week six:</b>	<i>Stereolithography (SLA) and Modeling (FDM) Polymers of Metals and Other Materials</i>
<b>Week seven:</b>	<i>Revision</i>
<b>Week eight:</b>	<i>Application of Reverse Engineering</i>
<b>Week nine:</b>	<i>3D scanning</i>
<b>Week ten:</b>	<i>3D modeling theory</i>
<b>Week eleven:</b>	<i>Modeling of objects</i>
<b>Week twelve:</b>	<i>Laboratory exercises</i>
<b>Week thirteen:</b>	<i>Modeling complex objects with 3D software and VR</i>

<b>Week fourteen:</b>	<i>Presentation of course work</i>
<b>Week fifteen:</b>	<i>Summary</i>

<b>Academic policies and rules of conduct</b>
---

<i>Regular attendance of lectures and exercises is necessary, as well as active participation with discussion and solution of tasks.</i>
--