

Syllabus

1. Information about the **Module 6**

1.1 University	Constantine the Philosopher University in Nitra
1.2 Team	UKF_Team
1.3 Trainer_Name	Associate Professor Stefan Koprda Associate Professor Zoltan Balogh Assintant Professor Martin Magdin
1.3 Degree level	Bachelor/Master degree

2. Information about the course

Module title	Basic Maintenance
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3. Time budget

3.1 Number of hours	5 h	divided in:	Lecture	90 mins	Laboratory/ Project	210 mins
3.2 Time budget distribution (hours) for individual activity:						
(a) Individual study (course, obligatory bibliography, etc.)						1
(b) Additional documentation (recommended bibliography, etc.)						0.5
(c) Preparation for seminary/laboratory/project activities						0.5
(d) Peer learning						0
(e) Exam preparation						0
(f) Other activities						0
3.3 Total individual study (sum (3.7(a)...3.7(f)))				2 h		
3.4 ECTS credits				0.2		

4. Preconditions

4.1 curriculum	Librarian/ student of bachelor and master's degree
4.2 competences	Technical skills, computer using knowledge

5. Course requirement

5.1. for lecture	Lecture room with video projector, laptop
5.2. for seminary/ laboratory/ project	Laboratory room with video projector, laptop, 3D printers

6. Gained competences

Professional competences	<p>Student (or the qualified person) will:</p> <ol style="list-style-type: none"> 1. Be a specialist for 3D printer maintenance by studying the basic concepts and principles of 3D printer operation, 2. Acquire competencies for the introduction of new technologies in libraries 3. Gain the ability to help and advise in choosing a 3D printer
Transversal competenc	<ol style="list-style-type: none"> 1. Familiarity with specific roles and teamwork activities and distributing tasks to subordinate levels

7. Course objective

7.1 General objective	Ability to find the error that causes the 3D printer to fail and further analyse how to prevent the 3D printer from malfunctioning. Proper use and settings of 3D printers.
7.2 Specific objectives	<p>Learners should be able to:</p> <ul style="list-style-type: none"> - provide basic support of 3D printers to users in the event of a failure; - analyze malfunctions and determine how to prevent them; - will be able to train users of 3D printers so that they can eliminate basic malfunctions themselves; - facilitate the production process and increase performance by preventing failures;

8. Contents

8.1 Lecture	Hours	Teaching methods	Observation
Basic Maintenance	90 mins	Video projector exposure methods, whiteboard explanations and discussions	
- Introduction to 3D printing and servicing			
- Regular maintenance of Prusa i3 printers			
- Nozzle replacement or reparation			
- Belt tension adjustment			
- Disassembly of hotend & heatbreak stuck in cooler			

- Printer maintenance tips			
8.2 Seminary / Laboratory / Project	Hours	Teaching methods	Observation
Basic Maintenance		observation illustration practical examples	
1.1 Regular maintenance of i3 printers, Nozzle replacement or replacement, Belt tension adjustment	60 mins		
1.2 Disassembly of hotend & heatbreak stuck in cooler, Manual removal of fibre from the extruder, Checking / aligning the feed wheels	60 mins		
1.3 How to shorten a PTFE tube - Original Prusa printer, Replacement of PEI foil	30 mins		
1.4 How to replace a hot end thermistor, How to replace a heatbreak / heating block/cooler	30 mins		
1.5 Firmware update, Safety testing, Printer maintenance tips	30 mins		
<p>9. 3 Bibliography:</p> <p>[1] BOEHLER. W., MARBS. A. 2002. 3D scanning instruments. [online] 2002. [cit. 2020-05-03]. Available on internet: <https://bit.ly/3sb7e5z></p> <p>[2] JENNINGS, A. 2021. Troubleshooting Common 3D Printing Problems. [online] 2021.[cit. 2021-03-31]. Available on internet: https://bit.ly/3g7QRnX</p> <p>[3] MAKE 3D EXPERIENCE, 2018. Introduction to 3D printing - additive processes. [online] 2018. [cit. 2021-02-24]. Available on internet: https://bit.ly/3fWdxHu</p> <p>[4] NOORANI, R. 2018. 3D Printing Technology, Applications, and Selection. 1. vydanie. Taylor & Francis Group, LLC, 2018, 271 s. ISBN 978-1-4987-8375-0.</p> <p>[5] PETTY, J. 2019a. What is 3D Modeling & What's It Used For? [online] 2019. [cit. 2021-04-15]. Available on internet: https://bit.ly/3a8uIBW</p>			

[6] VOSSELMAN, G., MAAS, H. 2013. 3D Printing Technology, Applications, and Selection. CRC Press, 2013, 320 s. ISBN 978-1439827987.

10. Evaluation at the end of the course

Activity	10.1 Evaluation criteria	10.2 Evaluation method	10.3 % of final grade
10.4 Lecture	Exam	Examination of knowledge is done by written assessment consisting of a complex topic, containing some theoretical questions of grid type.	40%
10.5 Seminary/ Laboratory/ Project		Presentation of developed project	60%
"10.6 Minimum performance:			5.0/10