D.T2.4.2 A Portfolio of Educational Activities to be tested by PPs

Collected by PP2	**Version 1**
	12 2017

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1. Individual pilot plans PP1

Course title	Arduino Laboratory
Short description (2-3 sentences, short information about the course to be used in the catalogue)	A Course for the presentation of Arduino Capabilities in the Scientific domain: data-logging, laboratory automation, low-cost sensors.
Language (in which language you offer the course during the pilot)	Italian
Prerequisites	Basic scientific skills and practice in scientific laboratory, basic statistics. (Basics electronics and prototyping).
Course instructor (short biography, if applicable)	Person with previous experience in training groups and experience in Arduino programming. Experience in Scientific Laboratory needs, problem solving, statistics, scientific experiment design and implementation.
Link (if applicable)	
Target group and age	Universitarian students with previous experience of scientific laboratories (Master, PhD, Post Docs), researchers. Eventually opened to highly specialized high school courses (e.g. Chemistry, Agricultural, or Scientific High schools).
Learning outcomes	Participants will be able to autonomously harvest data from sensors using Arduino and transfer them to the computer for analysis. They will be able to perform basics statistical evaluation, and face the major challenges of data acquisition/logging. They will be aware of the capabilities of the FabLab and the DIY world in assistance to scientific research.
Course contents and goals (learning outcomes)	The goal of the course is to demonstrate the role of FabLab, Community, DIY, Arduino in assistance to scientific research.
Course duration	10 h
Course structure	Weekly, 3 half-days, 1 day every week.

(hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	DAY1 1h Theory: precision, accuracy, resolution, basics of statistics, data analysis. 1h Theory: Data acquisition with Arduino(and RaspberryPI) and various sensors, an overview of the capabilities and limits. 1h presentation of the participants and their specific needs 1h hands on, basic Arduino data acquisition: 1 sensor over serial port COM-USB. Homeworks: data acquisition from a simple sensor, design of participant's own projects. DAY2 1h Theory: advanced data acquisition - adding GPS tag, RTC time stamp, dual exporting to SD card and Serial-USB. 1h FabLab capabilities and equipment for Laboratory automation. 2h hands-on prototyping the participants project. Homeworks: Visiting FL at least once, to continue the hands on and use the equipment. DAY3 1h Basics statistics and data analysis, lessons learnt. 1h presentation of the projects to other participants.
Assessment mode (final presentation, exam,…) and certificate (if applicable)	Final presentation of the project, certificate given.
future price per participant (incl. VAT)	90 €, included 1 free access to the FabLab
Min. and max number of attendees	6-15
Dates of the pilot course (preferably between 11/2017 and 5/2018)	April 2018
Comments (for internal use)	

Course title	Initial training Arduino
Short description (2-3 sentences, short information about the course to be used in the catalogue)	During the workshop the device will be described, together with its capabilities, functioning, and the software needed for programming. A practical session is following, where participants physically build some circuits by controlling various actuators via Arduino.
Language (in which language you offer the course during the pilot)	Italian
Prerequisites	no
Course instructor (short biography, if applicable)	Person with previous experience in training groups and experience in Arduino programming.
Link (if applicable)	http://www.muse.it/it/impara/trovattivit%C3%A0/attivita/Pagine/Workshop-base-con-Arduino.aspx
Target group and age	students (age 15-18)
Learning outcomes	The course aims at introducing Arduino and discovering basic techniques for programming and integrating electronic devices that are useful in creating new features and discovering the potential of interactive design.
Course contents and goals (learning outcomes)	The goal of the course is to be able to open the minds of the participants that will allow they to face big complex problems
Course duration	3 h
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	One block of 3 hours to be carried out during one afternoon, usually from 2PM to 5PM. Possibility to differentiate the week day targeting workers or students.

Assessment mode (final presentation, exam,...) and certificate (if applicable)	no
future price per participant (incl. VAT)	€ 7,00
Min. and max number of attendees	8-24
Dates of the pilot course (preferably between 11/2017 and 5/2018)	**February 2018**
Comments (for internal use)	

Course title	Introduction to robotic
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The laboratory is composed into a theoretical and practical electronic course. The students start from elementary electronic circuit and arrive at robot programming.
Language (in which language you offer the course during the pilot)	Italian
Prerequisites	no
Course instructor (short biography, if applicable)	Person with previous experience in training groups and experience in Arduino programming.
Link (if applicable)	http://www.muse.it/it/impara/trovattivit%C3%A0/attivita/Pagine/Introduzione-alla-robotica.aspx
Target group and age	young minds (age 10-14)
Learning outcomes	Participants will be able to autonomously program robots with simple instructions.
Course contents and goals (learning outcomes)	The goal of the course is to be able to open the minds of the participants that will allow they to face big complex problems
Course duration	2,5 h
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	One block of 3 hours to be carried out during one afternoon, usually from 2PM to 5PM. Possibility to differentiate the week day targeting workers or students.
Assessment mode (final presentation, exam,…) and certificate (if	no

applicable)	
future price per participant (incl. VAT)	€ 7,00
Min. and max number of attendees	8-24
Dates of the pilot course (preferably between 11/2017 and 5/2018)	**February 2018**
Comments (for internal use)	

2. Individual pilot plans PP2

Course title	All Female Makers Bootcamp - Digital Fabrication from A-Z
Short description (2-3 sentences, short information about the course to be used in the catalogue)	3D printer, Laser Cutter, CNC milling machine and Vinyl Cutter - with the right machines and tools everybody can produce and manufacture great things. In only seven days the "Fab Lab Bootcamp" offers an ideal introduction into the world of digital fabrication.
Language (in which language you offer the course during the pilot)	German
Prerequisites	basic experience in using a computer, no special skills needed
Course instructor (short biography, if applicable)	Anita Bauer is currently studying at the University of Applied Arts, besides that 2017 she studied ceramics at the Joshibi University for Art and Design, Tōkyō.Her interests lies in the intersections of the three fields of art / design / crafts. Where does one stop and where does the other begin? Where are overlapping areas? As part of her diploma thesis, she is looking at a new, expanded view of traditional craftsmanship, including the use of CNC machines, 3D printers, etc. As a trainer at Happylab she wants to encourage the participants to use these machines in a creative and experimental. Thomas Bitter (Lab Manager Happylab Vienna, since 2013). As an expert on digital fabrication and of the tutors he supports the participants in during their project starting with the modelling and the practical machine handling. Thanks to his long-term experience, he is able to find new approaches to help people realizing their ideas.
Link (if applicable)	
Target group and age	With this one-week female makers workshop we aim to focus on a specific target group - women who want to learn the technical skills to use digital fabrication tools to realize their own ideas and projects. In line with a low threshold approach at Happylab we try not only to fit the needs of women who are already familiar with the basics of digital fabrication, but also those who have little previous

	technical knowledge and. We address women who want to improve their skills due to the ever-changing demands of the job market, but also to female entrepreneurs, makers or small and medium-sized enterprises.
Learning outcomes	Basic knowledge of digital fabrication, construction of models, machine, basic technical knowhow of the maschine, machine handling
Course contents and goals (learning outcomes)	In the "Fab Lab Bootcamp" participants acquire the basics of digital fabrication - starting with the construction of three-dimensional models on the computer right up to using 3D printer, Laser Cutter, CNC milling machine and Vinyl Cutter. "Fab Lab Bootcamp" therefore offers the perfect introduction into the world of digital fabrication.
Course duration	● 2 days intensive workshop ● 5 days Individual work time ● final presentations
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	Fab Lab Bootcamp lasts for a week and is structured in the following way: • intensive workshop: Friday 9-19 & Saturday 10-19 • Free project work supported by experts: Monday - Friday • Final project presentation and feedback: Friday 16-18
Assessment mode (final presentation, exam,…) and certificate (if applicable)	Final presentation of the realised projects
future price per participant (incl. VAT)	345,- EUR
Min. and max number of attendees	Min. 5, max. 12
Dates of the pilot course (preferably between 11/2017 and 5/2018)	16.03. -23.03.2018

Comments (for internal use)	For the female makers bootcamp we have a cooperation with the business riot festival in Vienna - the festival aims to empower women in the labor market and focuses on equal treatment and female promotion in the work environment. During a female makers networking night, women can pitch why they should attend the the free female makers bootcamp and present the jury the ideas they want to realize during the week.

3. Individual pilot plans PP5

Course title	Initial Training - Tools and workshop use
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The course introduces students to general concept of StrojLab and rules which needs to be respected. Students are familiarized with safety rules and aids which needs to be used during operation of specific machines. The operation instructions to main equipment of the laboratory is introduced.
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	None
Course instructor (short biography, if applicable)	Any responsible StrojLab instructor who has passed the advanced courses or the internal academic staff.
Link (if applicable)	
Target group and age	Students in master´s degree study.
Learning outcomes	

Course contents and goals (learning outcomes)	1. General rules of StrojLab use. 2. Familiarization with operating regulations, safety aids, operating instructions to individual machines. 3. Instructions how to use Sandblasting machines. 4. Instructions how to use Matting box. 5. Instructions how to use ultrasound cleaners. 6. Instructions how to use metallographic grinder. 7. Instructions how to use compressed air. 8. Instructions how to use tempering ovens Memmert. 9. Instructions how to use hand tools in workshop. 10. Instructions how to use electrical hand tools. 11. Instructions how to use soldering stations and low voltage power supply. 12. Instructions how to use other StrojLab machines until they pass the training and will be able to independently work with them. 13. Instructions how to store own tools and material.
Course duration	4 hours
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	learning block
Assessment mode (final presentation, exam,…) and certificate (if	Students needs to sign, that they were familiarized and understand the safety rules which needs to be respected; and that they were familiarized and understand the operating instructions and safety aids of the StrojLab equipment.

applicable)	
future price per participant (incl. VAT)	free of charge for master degree student of FME BUT for others 100 EUR
Min. and max number of attendees	min. 2, max. 10 students
Dates of the pilot course (preferably between 11/2017 and 5/2018)	5. 2. 2018 - 4. 5. 2018
Comments (for internal use)	

Course title	Initial Training - 3D printing
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The course introduces students to the operation of 3D printer. Students will learn how to prepare a part for the print, how to prepare the printer, how to setup the parameters for the print and how to operate the printer itself.
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	Basic knowledge of CAD modeling softwares.
Course instructor (short biography, if applicable)	Ing. Tomáš Koutecký, Ph.D. Assistant professor, specialist in 3D scanning and 3D printing
Link (if applicable)	
Target group and age	Students in master´s degree study.
Learning outcomes	Slicing process 3D print settings 3D printer calibration
Course contents and goals	Flashprint - 3D print settings and slicing process FlashForge Dreamer - 3D printer calibration, print

(learning outcomes)	
Course duration	3 hours
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	learning block
Assessment mode (final presentation, exam,…) and certificate (if applicable)	Necessary condition for passing of the course is attendance and active participation in laboratory workshop. Student have to show the ability to work with 3D printer independently.
future price per participant (incl. VAT)	free of charge for master degree student of FME BUT Brno for others 200Eur
Min. and max number of attendees	min. 2, max. 10 students
Dates of the pilot course (preferably between 11/2017 and 5/2018)	5. 2. 2018 - 4. 5. 2018

Comments (for internal use)	

Course title	Initial Training - Vacuum forming
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The course introduces students to vacuum forming technology. Students will learn how to prepare the mould for the vacuum forming, how to handle the material, how to operate the vacuum forming machine and what to do, to successfully vacuum form prototype component.
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	None
Course instructor (short biography, if applicable)	doc.Ing. Daniel Koutný, Ph.D. Associate professor, specialist in Rapid prototyping: vacuum casting, vacuum forming, 3D printing, 3D scanning etc.
Link (if applicable)	
Target group and age	Students in master´s degree study.
Learning outcomes	vacuum forming process preparation of mould or vacuum forming preparation of material using Formech Fm 660

Course contents and goals (learning outcomes)	General info about vacuum forming Working with the machine Formech FM660 Clamping the material Forming process Requirements for the mould Fabrication of test part Postprocessing of formed prototypes
Course duration	3 hours
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	learning block
Assessment mode (final presentation, exam,…) and certificate (if applicable)	Necessary condition for passing of the course is attendance and active participation in laboratory workshop. Student in a learning group have to show the ability to form a couple of prototypes without assistance of lecturer.
future price per participant (incl. VAT)	free of charge for master degree student of FME BUT for others 200Eur
Min. and max number of attendees	min. 4, max. 8 students

Dates of the pilot course (preferably between 11/2017 and 5/2018)	5. 2. 2018 - 4. 5. 2018
Comments (for internal use)	

Course title	Advanced Training - 3D printing
Short description (2-3 sentences, short information about the course to be used in the catalogue)	Students will be able to effectively design and realize parts using additive manufacturing systems ("layer by layer"). Students can apply acquired experience during the solution of semester projects, theses and later in practice for development of new products. Knowledge of additive technologies including preparation and production of parts is in the Czech Republic unique and provides students advantage in labour market
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	Knowledge of CAD systems (i. e. CATIA, Creo, Rhinoceros, Inventor).
Course instructor (short biography, if applicable)	Radek Vrána researcher, 10 research articles in Scopus and conferences
Link (if applicable)	
Target group and age	Students in master´s degree study.
Learning outcomes	Support generation 3D data healing Preparation of manufacturing
Course contents and goals (learning outcomes)	Software data processing - Magics, error correction Software data processing - Magics, support generation Software data processing - Magics, preparation of SLM process
Course duration	6 hours

Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	2 hours/week computer labs.
Assessment mode (final presentation, exam,…) and certificate (if applicable)	The university course: Course-unit credit is awarded on the following conditions: elaboration of semester project, submitting data in digital form. Examination: will be granted after successful completion of the test focused on gained theoretical knowledge.
future price per participant (incl. VAT)	free of charge for master degree student of FME BUT Brno for other 500Eur
Min. and max number of attendees	16-26 students from more than two people
Dates of the pilot course (preferably between 11/2017 and 5/2018	18. 9. 2017 - 15. 12. 2017
Comments (for internal use)	Course in included to university course Additive Technologies https://www.vutbr.cz/en/studies/ects-catalogue/course-detail ?apid=186705

Course title	Application of Electric Drives - Arduino (FME BUT Brno - ZAE)
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The course introduces students to the ways of controlling the various machines and processes. Students will gain practical experience with control systems based on Arduino development boards and PLC from B&R Company. Students will program the control in open and closed loop for various dynamic systems.
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	Knowledge at undergraduate level in physics, mathematics and body mechanics is assumed
Course instructor (short biography, if applicable)	Roman Kozubík IT specialist, web design and programing, mobile applications programing
Link (if applicable)	https://www.vutbr.cz/en/studies/ects-catalogue/course-detail?ap id=186704
Target group and age	Students in master´s degree study.
Learning outcomes	Skills obtained in this course shall enable a student to gain understanding of fundamentals in electric control systems and shall enable to specify the control system requirements for specific application.

Course contents and goals (learning outcomes)	1. Arduino – programming the digital inputs and outputs, analog inputs, use of the display based on HD44780 driver, output to the console. 2. Arduino – Programming the control loop using analog sensor and PWM output. 3. Arduino – Controlling the stepper motors and servo motors. 4. Arduino – Measuring of acceleration using digital sensor with I2C or SPI bus. 5. Arduino – interrupts and timers 6. Possibilities and practical use of frequency drive inverters.
Course duration	10 hours
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	2 hour/week or learning block
Assessment mode (final presentation, exam,…) and certificate (if applicable)	Necessary condition for passing of the course is attendance and participation in laboratory exercises and in lessons with computer support. Students will be evaluated according to the number of fulfilled tasks and the quality of their solution.
future price per participant (incl. VAT)	free of charge for master degree student of FME BUT Brno for others 500 EUR

Min. and max number of attendees	16-26 students from more than two people
Dates of the pilot course (preferably between 11/2017 and 5/2018)	5. 2. 2018 - 4. 5. 2018
Comments (for internal use)	

Course title	Robotic workshop
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The course introduces students to the operating the 6 axis robot KUKA KR 60HA. Students will gain practical experience with manual control of the robot, safety rules, setting up new tool with corrections and writing simple code by positions.
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	Basic knowledge of operating CNC machines
Course instructor (short biography, if applicable)	Ing. David Škaroupka, Ph.D. Assistant professor, industrial designer experienced in prototyping
Link (if applicable)	
Target group and age	Students in master´s degree study.
Learning outcomes	Skills obtained in this course shall enable a student to gain fundamentals with 6 axis robot controlling and safety. They will be able to prepare robot for running the program and checking the processes regarding to robot movements.

Course contents and goals (learning outcomes)	1. Pre-start safety check, using and control compressed air, safety zones, action radius of the robot 2. Starting robot and pass through safety checks to move with it. Working with KCP. 3. Types of hand controlling by axis systems or 3D mouse 4. Setting up new tool by 4-point method or length correction 5. Run the program, homing, changing the tool 6. Writing simple program by positions
Course duration	6 hours
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	learning block
Assessment mode (final presentation, exam,…) and certificate (if applicable)	Necessary condition for passing of the course is attendance and active participation in laboratory workshop. Student have to show the ability to work with robot independently.
future price per participant (incl. VAT)	free of charge for master degree student of FME BUT Brno for others 900 EUR

Min. and max number of attendees	*min 4, max 8 students*

Dates of the pilot course (preferably between 11/2017 and 5/2018)	
Comments (for internal use)	

Course title	**Mechanical Design Project** (FME BUT Brno - ZIP)
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The course introduces students to the ways of controlling the various machines and processes. Students will gain practical experience with control systems based on Arduino development boards and PLC from B&R Company. Students will program the control in open and closed loop for various dynamic systems.
Language (in which language you offer the course during the pilot)	Czech
Prerequisites	Knowledge in area of 3D printing, finite element method, diagnostics systems, 3D parametric modeling, project management and experience with teamwork
Course instructor (short biography, if applicable)	IT specialists, Senior Lecturers
Link (if applicable)	http://www.fme.vutbr.cz/studium/predmety/predmet.html?pid=1 86712&lang=1
Target group and age	Students in master´s degree study.

Learning outcomes	Students will gain deeper knowledge of CAD tools, advanced tools of engineering analyses using FEM. They also get experiences in non-destructive methods for machine diagnostics. Furthermore, they acquire ability to design new solutions in a given technical field. After passing the course, students will be able to effectively solve technical problems in given areas; to perform critical analysis of proposed solutions and to design optimized solution with their own contribution.
Course contents and goals (learning outcomes)	1. Presentation of project topics, division of competences, map of the project, Gantt diagram 2. Problem analysis, literature review. 3. Proposal and analysis of alternative solutions. 4. Checkpoint with presentation of achieved results. 5. Project costs calculation. 6. Drawing documentation. 7. Checkpoint with presentation of achieved results. 8. Implementation of the selected solution. 9. Experimental verification.
Course duration	10 hours/compulsory
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	1 hour/week or learning block
Assessment mode (final presentation,	Course-unit credit is awarded on the following conditions: regular attendance at classes, submission of two fully developed projects

exam,…) **and** **certificate** **(if** **applicable)**	in digital and printed form. In the digital format shall be delivered: 1. CAD data (for construction projects). 2. Technical report or final report. 3. Drawings (if required by assignment). 4. Poster in PPTX format and PDF format for printing. 5. Presentation in PPTX format. In paper form will be delivered: 1. Technical or final report, 2. Drawings Examination: exam will be awarded on the basis of presentation and successful defense. Final mark is the average of marks awarded by evaluators during defense of the project
future price **per participant** **(incl. VAT)**	free of charge for master degree student of FME BUT Brno for others 100Eur/student
Min. and **max** **number of** **attendees**	10-20 students from more than two people
Dates of the pilot **course** **(preferably** **between** **11/2017** **and 5/2018)**	5. 2. 2018 - 4. 5. 2018
Comments (for **internal use)**	The subject combine the knowledge obtained from pre-courses and self-study.

4. Individual pilot plans PP6

Course title	Product development: 3D modelling – prototyping - making
Short description (2-3 sentences, short information about the course to be used in the catalogue)	The participant of the course will design a 3D model of his own idea, create first prototype of the product and then the proof of concept will be made – the trainer will help to improve the idea, exclude all eventual errors etc. At the end of the course the final 3D modelling and creating the product on the 3D equipment in our FabLab will be made.
Language (in which language you offer the course during the pilot)	polish
Prerequisites	Basic knowledge in terms of 3D modelling – the course will be provided for intermediates
Course instructor (short biography, if applicable)	Tbd.
Link (if applicable)	Tbd.
Target group and age	Preferably students and young people between 17-25 years old
Learning outcomes	- Learning the CAD program - 3D modelling - Rapid prototyping - Learning to operate FabLab machines – 3D printers, 3D scanner, laser cutter etc. - Upgrading skills
Course contents and goals (learning outcomes)	See "short description" and "learning outcomes"
Course duration	Up to 20 hours
Course structure (hours, weekly, monthly, blocked) and division in	Depends on students' needs, we plan 4 hours a week

practice, lectures, homework (if applicable)	
Assessment mode (final presentation, exam,…) and certificate (if applicable)	- Short, simple projects verifying gained skills - Certificate of completing the course
future price per participant (incl. VAT)	Will be evaluated after the Pilot Action
Min. and max number of attendees	5-10
Dates of the pilot course (preferably between 11/2017 and 5/2018)	11. 2017 – 03. 2018
Comments (for internal use)	

5. Individual pilot plans PP7

Course title	3D design for 3D printing
Short description (2-3 sentences, short information about the course to be used in the catalogue)	You broke a part in your favorite toy? You want to customize the holder of your fridge or have your self design puppet or whatever you imagine? Come and learn how to design it on a free 3D design software and how to print it on our 3D printer!
Language (in which language you offer the course during the pilot)	Slovene
Prerequisites	None
Course instructor (short biography, if applicable)	Tomo Per, RogLab's guru of 3d printing. He left schools at 16 years old and followed its own path to become a master in 3D technologies, design and photography. He's a living example of the "learning-by-doing" concept.
Link (if applicable)	n/a
Target group and age	10-14 years old. Is also suitable to adults who have not forgotten they were once child.
Learning outcomes	Create your own design on TinkerCad (free open software). Print your part on the RogLab's 3D printer.

Course contents and goals (learning outcomes)	Very short theoretical part:
	
	● A very brief introduction of the functioning of the 3D printer
	    o Presentation of various technologies of 3D printing
	    o Technological principles
	    o Introduction to 3D files for 3D printing
	● Brief introduction of the basic function of the software for 3d design
	
	Hands-on:
	
	Each participant will draw its own basic 3D design on TinkerCad and then 3D print it.

Course duration	2x 2 hours (+ 2 optional practical hours performed by a school teacher / associated partner)
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	2 sessions of 2 hours. For more better outputs, an additional session of hands-on has to be performed by the classroom teacher between the 2 sessions.
Assessment mode (final presentation, exam,…) and certificate (if applicable)	None
future price per participant (incl. VAT)	200 € per group. Performed in the school's classroom all over Slovenia. (price is not yet finally determined)
Min. and max number of attendees	8-15 participants
Dates of the pilot course (preferably between 11/2017 and 5/2018)	February 2017
Comments (for internal use)	This is the first session of a 2 session course about 3D printing for children. It can be also performed as an independent session.

Course title	Laser cutting 2 : Digital drawing strikes back.
Short description (2-3 sentences, short information about the course to be used in the catalogue)	Masterize the Force of the laser by learning how to draw your own 2D-design on a computer. Then cut it and engrave it on wood or Plexiglas.
Language (in which language you offer the course during the pilot)	Slovene
Prerequisites	Laser cutting 1 : May the Force be in your fingers! A basic knowledge of a drawing software like MS Paint is welcomed but not mandatory
Course instructor (short biography, if applicable)	Tomo Per, RogLab's guru of lasercutting. He left schools at 16 years old and followed its own path to become a master in 3D technologies, design and photography. He's a living example of the "learning-by-doing" concept.
Link (if applicable)	n/a
Target group and age	10-14 years old. Is also suitable to adults who have not forgotten they were once child.
Learning outcomes	Design your own design on Inkscape (free open software). Fabricate it with the help of laser cutter / engraver.
Course contents and goals (learning outcomes)	Very short theoretical part: A very brief introduction of the concept of vectorial pictures / vs pixeled pictures Presentation of the basic functions of the software Hands-on: Each participant will draw its own design on Inskape and then cut and engrave it on wood or Plexlglas-
Course duration	2x 2 hours (+ 2 more practical hours perfomed by a school teacher, associated partner)
Course structure (hours, weekly, monthly, blocked) and division in	2 sessions of 2 hours. For more better outputs, an additional session of hands-on has to be performed by the classroom teacher between the 2 sessions.

practice, lectures, homework (if applicable)	
Assessment mode (final presentation, exam,…) and certificate (if applicable)	None
future price per participant (incl. VAT)	200 € per group. Performed in the school's classroom all over Slovenia. (price is not yet finally determined)
Min. and max number of attendees	8-15 participants
Dates of the pilot course (preferably between 11/2017 and 5/2018)	February 2017
Comments (for internal use)	This is the second session of a 3 session course about laser cutting for children. It can be also performed as an independent session.

Course title	Laser cutter: may the Force be in your fingers!
Short description (2-3 sentences, short information about the course to be used in the catalogue)	Unleash the Force hiding within your finger! If you follow the path of our DIY Guru, you will be able to cut and burn wood with your own mind and fingers, only by using the Force… and the laser cutter of course!
Language (in which language you offer the course during the pilot)	Slovene
Prerequisites	None
Course instructor (short biography, if applicable)	Tomo Per, RogLab's guru of lasercutting. He left schools at 16 years old and followed its own path to become a master in 3D technologies, design and photography. He's a living example of the "learning-by-doing" concept.
Link (if applicable)	n/a
Target group and age	10-14 years old. Is also suitable to adults who have not forgotten they were once child.
Learning outcomes	Cut and engrave your own hand-drawn 2D designed. Cut and engrave 2D or 3D open models downloaded from the Internet .
Course contents and goals (learning outcomes)	Very short theoretical part: General presentation of the technics of laser cutting and engraving. Safety instructions. Presentation of 3D models and other objects made with the laser cutter Hands-on: Hand drawing, scanning draws, uploading file to the scanner, setting up the scanner, launching the job.
Course duration	2 hours (+ 2 more practical hours perfomed by a school teacher, associated partner)
Course structure (hours, weekly, monthly, blocked)	Blocked

and division in practice, lectures, homework (if applicable)	
Assessment mode (final presentation, exam,…) and certificate (if applicable)	None
future price per participant (incl. VAT)	200 € per group. Performed in the school's classroom all over Slovenia. (price is not yet finally determined)
Min. and max number of attendees	8-15 participants
Dates of the pilot course (preferably between 11/2017 and 5/2018)	January 2017
Comments (for internal use)	This is the first session of a 3 session course about laser cutting for children. It can be also performed as an independent session.

6. Individual pilot plans PP8

Course title	**Python & Electronics**
Short description (2-3 sentences, short information about the course to be used in the catalogue)	After the course students should understand the terms: Python programing language, microprocessor programming, electronics, programmable microcontrollers, MicroPython, Arduino IDE, serial communication, compilation, hardware sensors
Language (in which language you offer the course during the pilot)	slovak, english
Prerequisites	none
Course instructor (short biography, if applicable)	Marek Mansell
Link (if applicable)	http://marekmansell.sk/
Target group and age	Electronics beginners
Learning outcomes	Graduates should understand the basic principles of designing and programming hardware devices. Thanks to practical projects, they will learn the basics of hardware automation and embedded software development. During the course they will learn how to sense the real world through electronic devices such as temperature and humidity sensors, motion sensors, light sensors and much more. After programmatically processing the data they will use devices such as relays, motors, lights or buzzers to react to the changes in the environment.
Course contents and goals (learning outcomes)	MicroPython, electronics programming, understanding the concept of programming microcontrollers, distinguishing different microcontrollers, SoC (System on Chip), wireless communication, communication protocols, security protocols, LED switching, multi color LED controller, light dimming, current and

	voltage measurement, battery power usage
Course duration	1 semester
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	2 hours (hands on workshops) 1 semester
Assessment mode (final presentation, exam,…) and certificate (if applicable)	assessment based on presentation of real products (credits after passing the exam)
future price per participant (incl. VAT)	-
Min. and max number of attendees	*7-15*
Dates of the pilot course (preferably between 11/2017 and 5/2018)	
Comments (for internal use)	

Course title	Course System Thinking in IT
Short description (2-3 sentences, short information about the course to be used in the catalogue)	After the course students should understand the terms: Enterprise Architecture, TOGAF, ITIL, Metadata Based Management systems, Basic of Project Management, Principles of teamwork based on Win/Win Strategy, IoT, Industry 4.0 and much more...
Language (in which language you offer the course during the pilot)	slovak
Prerequisites	none
Course instructor (short biography, if applicable)	doc. Ing. Tibor Krajčovič, PhD. Faculty of Informatics and Information Technologies STU in Bratislava , http://www.fiit.stuba.sk Ing. Roman Kazička, CSc, NGO Agnicoli , http://www.agnicoli.org
Link (if applicable)	
Target group and age	Students of Faculty of Informatics and Information Technologies STU in Bratislava
Learning outcomes	Graduates should understand the systems that include IT solutions at 3 basic levels - at the level of business processes, systems, and technology. Systematic approach to problem solving. Ability to consider the entire life cycle of solutions in terms of business and technical solutions. By passing the subject the student acquires basic knowledge about digital production technologies, how to generate computer code and change to physical objects. The development of digital production technologies is based on creating codes that are not only about describing things, but also about making them. Students will learn how to transform the idea, intention, prototype project, and document their ideas through practical experience with digital production tools. They learn about the different code formats and their conversion to physical objects. In addition to theoretical knowledge, students will also gain practical skills: how to use the

	rapid production prototyping of Fab Lab, how to use CAD modeling software, a vinyl cutter, laser cutter, 3D printer, 3D scan and print, CNC cutter, Manufacture of printed circuit boards.
Course contents and goals (learning outcomes)	Enterprise Architecture, TOGAF, ITIL, Metadata Based Management systems, Basic of Project Management, Principles of teamwork based on Win/Win Strategy, IoT, Industry 4.0
Course duration	1 semester
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	5 hour per week (lectures + workshops) 1 semester
Assessment mode (final presentation, exam,…) and certificate (if applicable)	assessment based on presentation of real products (credits after passing the exam)
future price per participant (incl. VAT)	-
Min. and max number of attendees	*15-20 (17 attanding)*
Dates of the pilot course (preferably between 11/2017 and 5/2018)	
Comments (for internal use)	

7. Individual pilot plans PP9

Course title	Digital Tie Design - Introduction to vinyl cutting
Short description (2-3 sentences, short information about the course to be used in the catalogue)	Using hand drawing (from art course) as a starting point to simple digital fabrication using, camera to digitize, software to draw, trace and modify, and vinyl cutter and iron to transfer to textile. Simple but efficient course with visual impact for improve STE[A]M skills using digital technology.
Language (in which language you offer the course during the pilot)	Croatian or English
Prerequisites	Work from art course and basic computer usage
Course instructor (short biography, if applicable)	Mrs. Silvana Pešut Vitasović leading in collaboration with art course teacher with FabLab.hr support! During last 15 years Silvana is employed in primary school as a teacher of technical education. I have much experience with design, construction and modelling. Also I took part in many robotics, programming and electronics projects. I have also been a regional leader for technical education teachers association in Zagreb for last four years and I have been cooperate in FabLab.hr since the beginning 2016.
Link (if applicable)	
Target group and age	Elementary school pupils, General population all ages
Learning outcomes	- hand drawing pre-requirements - working with camera - import drawing to bitmap software - bitmap computer drawing - basic bitmap modification (contrast, brightness, bitmap editing) - tracing bitmap and export vector format - working with vinyl cutter and prepare folie to transfer (remove) - working with iron and transfer to textile - safety precautions
Course contents and goals (learning outcomes)	Course is prepared to make easy start working with simple digital fabrication process. Attendees would go over whole process from drawing to individual end product on textile, step by step, with basic commands for modification and safety precautions.

Course duration	2 x 2h (additional 1 x 1-2h if bitmap and vector editing is performed)
Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	- **Hand drawing digitalization and tracing (2h)** - **Bitmap and vector modification (2h, optional)** - **Vinyl cutting and thermo-transfer (2h)**
Assessment mode (final presentation, exam,…) and certificate (if applicable)	- **Final product presentation, comparison with hand drawing** - **Self Assessment and evaluation** - **No certificate**
future price per participant (incl. VAT)	**Free of charge for schools, 75 EUR per participants elsewhere (tbc). Consumables 5-15 EUR not included (cotton bags or T-shirts).**
Min. and max number of attendees	*8-16*
Dates of the pilot course (preferably between 11/2017 and 5/2018)	**11/2017 tbc**
Comments (for internal use)	

Course title	**3D LED Lamp Design**
Short description (2-3 sentences, short information about the course to be used in the catalogue)	**LED Lamp Design is course which integrate basic skills of 3D modeling, use of 3D printer with some electronics and soldering basics.** **Course start with design of simple LED Lamp box for electronics and power. When design is finished, use 3D printer to print lamp, and integrate soldered electronics with power source. Simple 3D course but efficient course with visual impact for improve STEM skills using digital technology.**
Language (in which language you offer the course during the pilot)	**Croatian or English**
Prerequisites	**Basic computer usage**
Course instructor (short biography, if applicable)	**Mrs. Silvana Pešut Vitasović leading in collaboration with physic course teacher with FabLab.hr support!** **During last 15 years Silvana is employed in primary school as a teacher of technical education. I have much experience with design, construction and modelling. Also I took part in many robotics, programming and electronics projects.** **I have also been a regional leader for technical education teachers association in Zagreb for last four years and I have been cooperate in FabLab.hr since the beginning 2016.**
Link (if applicable)	
Target group and age	**Elementary school pupils, General population all ages**
Learning outcomes	- **setup basic environment (units, views, interface)** - **generate basic shapes** - **modify 3D models** - **save and export models** - **prepare model for 3D print (slicing)** - **working with 3D printer with safety precautions** - **basic soldering skills with safety precautions** - **learn more about electric circuit, electronics parts**
Course contents and goals (learning outcomes)	**Course is prepared to make easy start working with 3D modeling and 3D printer with practical task.**
Course duration	**3 x 2 hours**
Course structure	- **3D modeling (2h)**

(hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	- **slicing and 3D printing (2h)** - **soldering and assembling (2h)**
Assessment mode (final presentation, exam,…) and certificate (if applicable)	- **Final product presentation, comparison with hand drawing** - **Self Assessment and evaluation** - **No certificate**
future price per participant (incl. VAT)	**Free of charge for schools, 75 EUR per participants elsewhere (tbc). Consumables 15 EUR not included.**
Min. and max number of attendees	*8-16*
Dates of the pilot course (preferably between 11/2017 and 5/2018)	**11-12/2017 tbc**
Comments (for internal use)	

Course title	Mobile Pets - Introduction to 3D modeling
Short description (2-3 sentences, short information about the course to be used in the catalogue)	Using hand drawing (from art course) as a starting point to simple digital fabrication using, camera to digitize, software to draw, trace and modify, and vinyl cutter and iron to transfer to textile.
Language (in which language you offer the course during the pilot)	Croatian or English
Prerequisites	Basic computer usage / Basic 3D modeling is preferable
Course instructor (short biography, if applicable)	Mrs. Silvana Pešut Vitasović leading in collaboration with biology course teacher with FabLab.hr support! During last 15 years Silvana is employed in primary school as a teacher of technical education. I have much experience with design, construction and modelling. Also I took part in many robotics, programming and electronics projects. I have also been a regional leader for technical education teachers association in Zagreb for last four years and I have been cooperate in FabLab.hr since the beginning 2016.
Link (if applicable)	
Target group and age	Elementary school pupils, General population all ages
Learning outcomes	- setup environment (units, views, interface) - generate advanced 3D shapes - modify 3D models - working with groups/components - save and export models - prepare model for 3D print (slicing) - working with 3D printer with safety precautions - basics of video editing / stop animation - GIF creation
Course contents and goals (learning outcomes)	Course is prepared to make more demanding 3D modeling and presentation with GIF animation.
Course duration	4 x 2 hours

Course structure (hours, weekly, monthly, blocked) and division in practice, lectures, homework (if applicable)	- **3D modeling (4h)** - **slicing and 3D printing (2h)** - **video editing and GIF creation (2h)**
Assessment mode (final presentation, exam,…) and certificate (if applicable)	- **Final product presentation, comparison with hand drawing** - **Self Assessment and evaluation** - **No certificate**
future price per participant (incl. VAT)	**Free of charge for schools, 100 EUR per participants elsewhere (tbc)**
Min. and max number of attendees	*8-16*
Dates of the pilot course (preferably between 11/2017 and 5/2018)	**3/2018 tbc**
Comments (for internal use)	