



VOCATIONAL EDUCATION PROGRAMME FOR COMPUTER SPECIALISTS

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DESCRIPTION OF COMPULSORY MODULES

MODULE “SOFTWARE (EXAMPLES: OFFICE APPS, GOOGLE DOCS)” DESCRIPTION

Purpose of module: *(acquired competence) create and edit office documents.*

Create and edit offline and online.

Module title	Software (Examples: Office apps, Google docs)	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	3 credits (i.e. module scope in hours divided by one credit scope, e.g.: 75:25=3 credits).	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary.	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Create documents. Create spreadsheets Manage spreadsheets Create presentations Online Forms Work and control online results and create chart graphics.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
E.g.: Create documents. Create spreadsheets. Create presentations. Create and supervise online contents.	<p style="text-align: center;">1.1. Topic. Office Aps</p> <p><i>Tasks:</i></p> 1.1.1. Create and edit a text document 1.1.2. Create forms and presentation 1.1.3. Create and manage spreadsheet <p style="text-align: center;">1.2. Topic. Google Docs</p> <p><i>Tasks:</i></p> 1.2.1. Create a text document with google	<p>Satisfactory: Create office documents</p> <p>Good: Create and control office documents</p> <p>Excellent:</p>

	docs 1.2.2. Create a form with google docs 1.2.3. Create a spreadsheet with google docs 1.2.4. Create a presentation with google docs	Create and control office documents and use google docs tools
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	Learning material: Example: 1. <i>Office</i> : http://www.gcflearnfree.org/subjects/office/ 2. <i>Google Docs</i> : https://www.lynda.com/Google-Docs-training-tutorials/430-0.html	
	Learning supplies: computer software, internet.	
	Other resources: -	
Teachers' qualification	Profession teacher with the following qualifications: <ul style="list-style-type: none"> Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <i>Or:</i> <ul style="list-style-type: none"> Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	Ana Ribeiro, Fernando Mesquita	

- Assessment grade of acquired knowledge “Excellent“ encompasses the knowledge level assessable by “Good“ and “Satisfactory“ grades; assessment grade “Good“ encompasses the knowledge level assessable by “Satisfactory“ grade.

MODULE “NETWORK ADMINISTRATION“ DESCRIPTION

Purpose of module: *(acquired competence) to manage a network computer and other devices*

Module title	Network administration	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	8 credits (i.e. module scope in hours divided by one credit scope, e.g.: 200:25=8 credits).	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary.	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Network Administration with windows systems. Network Administration with Linux systems.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
E.g.: Network administration. Windows System. Linux System.	<p>Topic. Network Administration</p> <p><i>Tasks:</i></p> <p>1.1.1. Designing and planning the network</p> <p>1.1.2. Installing network and computer systems</p> <p>1.1.3. Maintaining, repairing and upgrading network and computer systems</p> <p>1.1.4. Diagnosing and fixing problems or potential problems with the network and its hardware, software and systems</p> <p>1.1.5. Monitoring network and systems to improve performance</p> <p>Expanding the network</p>	<p>Satisfactory: Network application</p> <p>Good: Network configuration/management</p> <p>Excellent: Network updating and upgrading</p>

Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.
Material resources	<p>Learning material:</p> <p>Example:</p> <ol style="list-style-type: none"> 1. <i>Lynux operating system user manual</i>, available on the Internet: https://help.ubuntu.com/community. 2. https://training.linuxfoundation.org/linux-courses/system-administration-training/essentials-of-system-administration 3. http://www.newhorizons.com/courses-and-certifications/microsoft-technical/windows-server
	Learning supplies: Computer hardware, computer software.
	Other resources: -
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology.
Module organizers	Ana Ribeiro, Fernando Mesquita

- Assessment grade of acquired knowledge “Excellent“ encompasses the knowledge level assessable by “Good“ and “Satisfactory“ grades; assessment grade “Good“ encompasses the knowledge level assessable by “Satisfactory“ grade.

MODULE “DATABASES“ DESCRIPTION

Purpose of module: (*acquired competenc*) to acquire a competence by creating a database and manipulating data using sql queries. (the purpose is defined by one sentence and corresponds with the target competence).

Module title	Databases	
Module code	Not applicable	
LTKS (LTqualification standards) level	IV	
Volume of credits	4 credits (i.e. module scope in hours divided by one credit scope, e.g.: 100:25=4 credits).	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary.	
General competencies developed in the module	<p>Communication in the first (native) language; Communication in foreign languages; Fundamentals The Relational Model Structured Query Language. Data Modeling and the Entity-Relationship Model Database Design Database Administration Database Processing Applications and Business Intelligence SQL</p>	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
E.g.: Administration/ management of database. SQL for Table and Constraint Modification and Deletion.	<p>1.1. Topic. Database <i>Tasks:</i> 1.1.1. Install the Mysql Database Software 1.1.2. Plan the Database 1.1.3. Create and Open the Database 1.1.4. Back Up the Database</p> <p>1.2. Topic. SQL</p>	<p>Satisfactory: Creation of a database.</p> <p>Good: Creating a database and manipulating data.</p> <p>Excellent:</p>

	<p><i>Tasks:</i></p> <p>1.2.1. Create, alter, and drop database objects such as tables and views.</p> <p>1.2.2. Exercises about DML – Data Manipulation Language (Select, Insert, Update, Delete)</p>	Creation of a database, administration/ management.
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	<p>Learning material:</p> <p>Example:</p> <ol style="list-style-type: none"> 1. <i>Sql syntax</i>, available on the Internet: https://www.w3schools.com/sql/ 2. <i>Model ER:</i> <ol style="list-style-type: none"> a. http://searchsqlserver.techtarget.com/definition/entity-relationship-model 	
	Learning supplies: computer software, Mysql	
	Other resources: -	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	Ana Ribeiro, Fernando Mesquita	

- Assessment grade of acquired knowledge “Excellent“ encompasses the knowledge level assessable by “Good“ and “Satisfactory“ grades; assessment grade “Good“ encompasses the knowledge level assessable by “Satisfactory“ grade.

MODULE “WEB DESIGN (HTML; CSS)” DESCRIPTION

Purpose of module: (acquired competence) to acquire a competence by creating a web site using html language and css (the purpose is defined by one sentence and corresponds with the target competence).

Module title	Web design (HTML; CSS)	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	4 credits (i.e. module scope in hours divided by one credit scope, e.g.: 100:25=4 credits).	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary.	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Html: Tags Tables Iframes Images CSS: Borders Backgrounds Colors Fonts Text Effects	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
E.g.: Creation of a web site with menus, galleries and css use.	1.1. Topic. Html <i>Tasks:</i>	Satisfactory: Create a web site with

	<p>1.1.1. Identify accessibility requirements in HTML,</p> <p>1.1.2. Develop or help the HTML working group develop solutions</p> <p>1.1.3. Foster collaboration between experts in HTML and Web Accessibility</p> <p>1.2. Topic. CSS</p> <p><i>Tasks:</i></p> <p>1.3. Using the correct syntax in css.</p> <p>1.4. Managing colours, fonts and contents.</p>	<p>menus</p> <p>Good: Create a web site with menus, and gallery, videos.</p> <p>Excellent: Create a web site with menus, and gallery, videos and css use in colours and font style.</p>
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	Learning material:	
	Example:	
	<p>3. https://www.w3schools.com/html/</p> <p>4. https://www.w3schools.com/css/</p> <p>5. http://www.cssportal.com/online-css-editor/</p>	
	Learning supplies: Computer software, internet	
	Other resources: internet line.	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	Ana Ribeiro, Fernando Mesquita	

- Assessment grade of acquired knowledge “Excellent“ encompasses the knowledge level assessable by “Good“ and “Satisfactory“ grades; assessment grade “Good“ encompasses the knowledge level assessable by “Satisfactory“ grade.

MODULE “CLASSICAL PROGRAMMING LANGUAGES “DESCRIPTION

Purpose of module: *The doctrine sought to use the most widespread programming languages and patterns to create complex applications.*

Module title	Classical programming languages	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	4 credits (i.e. module scope in hours divided by one credit scope, e.g.: 100:25=4 credits).	
Preparation required for learning	Project management Programming engineering	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression;	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Familiar with the most commonly used programming patterns. Preparing an application with MVC (Model-View-Controller) architecture application. Uses best practices according to the ORM (Object-Relational	1.1. Programming. <i>Tasks:</i> 1.1.1. The need for use of programming patterns 1.1.2. Using different programming patterns in the same application 1.1.3. MVVM (<i>Model-View-ViewModel</i>) the nature and use of programming pattern 1.1.4. MVP (<i>Model-View-Presenter</i>), nature of the programming and use of a pattern	Satisfactory: Created application are broadly working, but the Error management is not implemented properly, and all planned functionality has not been completed. Variety of software development patterns are used, but their selection is not properly justified. In documenta-

<p>Mapping) tools.</p> <p>Uses correctly standard code as agreed.</p> <p>Uses mathematics and logic functions for the preparation of applications.</p> <p>Understand the nature of the unit tests and their usage.</p> <p>Using in tests mock-classes.</p> <p>Documents the created applications in English.</p>	<p>1.1.5. Principle of <i>Inversion Control</i> and the its realization using <i>Dependency Injection</i></p> <p>1.1.6. <i>Repository</i> programming pattern</p> <p>1.1.7. <i>Singleton</i> programming pattern</p> <p>1.1.8. <i>Lazy loading</i> programming pattern and the different realization possibilities</p> <p>1.1.9. ASP.NET MVC application architecture</p> <p>1.1.10. Creating a simple ASP.NET MVC application using the <i>Repository</i>, MVVM, <i>Dependency Injection</i> and <i>Unit of Work</i> programming designs</p> <p>1.1.11. Knows what for ORM tools to use and what kind of patterns with them</p> <p>1.1.12. ORM tools related problems</p> <p>1.1.13. Using the <i>Repository</i> programming pattern for ORM'i realization of basic activities</p> <p>1.1.14. <i>Factory</i> programming pattern facilitate the creation of new objects</p> <p>1.1.15. Creating a database using the <i>Entity Framework</i> "code first" approach</p> <p>1.1.16. The necessity of testing</p> <p>1.1.17. Creating Unit Tests using Visual Studio tools</p> <p>1.1.18. Assays were initiated and improvement</p> <p>1.1.19. The unit tests to test?</p> <p>1.1.20. How <i>Dependency Injection</i> simplifies the creation of automated tests?</p> <p>1.1.21. Common code standards, best practices</p> <p>1.1.22. The need for compliance with the coding standards agreed the teamwork</p> <p>1.1.23. Asynchronous programming</p> <p>1.1.24. Logging of errors in solution</p> <p>1.1.25. Perform LINQ queries by exploiting existing ORM</p> <p>1.1.26. Different technologies and their use programming patterns</p>	<p>tion are used understandable English terminology</p> <p>Good:</p> <p>Created application runs smoothly and without any major errors. Programming pattern choice is justified and follow the best practices. In documentation are used understandable English terminology</p> <p>Excellent:</p> <p>Created application is running smoothly. Programming pattern choice is justified by the reasons are compelling. The development of applications previously created a summary analysis of the necessary development patterns. Asynchronous programming was used for creating application. Automatic tests there made in process. In documentation are used understandable English terminology.</p>
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	<p>1.1.27. Creation of class libraries and their use</p> <p>1.2. Topic. Project.</p> <p><i>Tasks:</i></p> <p>1.2.1. Making project plan</p> <p>1.2.2. Planning and executing software solution</p> <p>1.2.3. Project documentation</p>	
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	<p>Learning material:</p> <ol style="list-style-type: none"> 1. http://msdn.microsoft.com/en-us/data/ee712907 2. http://csharpdesignpatterns.codeplex.com/ S. Kumar, S 3. Suvashni, Software Testing using Visual Studio 2012, 2013 M. 4. Seemann, Dependency Injection in .NET, 2011 5. http://msdn.microsoft.com/en-us/data/ef.aspx - Entity Framework 6. http://www.dofactory.com/Patterns/Patterns.aspx - Development patterns 	
	Learning supplies: Computer class	
	Other resources: -	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	<p>Kaupo Nõlvak</p> <p>Ege Meister</p>	

MODULE “USAGE OF WORKSTATION OPERATING SYSTEMS“ DESCRIPTION

Purpose of module: *(acquired competence) to acquire a competence in usage of workstation operating systems. (The purpose is defined by one sentence and corresponds with the target competence).*

Module title	Usage of Workstation operating systems	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	2 credits (i.e. module scope in hours divided by one credit scope, e.g.: 50:25=2 credits).	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary.	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Administration/ management of digital files and workstation users by employing the operating system of that particular workstation.	1.1. Topic. Workstations and their operating systems. <i>Tasks:</i> 1.1.1. Understanding basic functions, purpose, and operation of workstations. 1.1.2. Understanding basic principles of the Linux operating system and the extent of its usage. 1.2. Topic. Basic functionality of the Linux operating system.	Satisfactory: New digital files are created in the file system of the operating system; users are included into security groups. Good: Security groups are altered, new users created, complex alterations to the file system are per-

	<p><i>Tasks:</i></p> <p>1.2.1. Using the filing system and network resources (<i>Samba</i>).</p> <p>1.2.2. Managing main directories and their contents.</p> <p>1.2.3. Managing security groups and their users.</p>	<p>formed.</p> <p>Excellent:</p> <p>New security groups are created, users are included into groups, the contents of main directories are altered, and complex alterations to the file system are performed.</p>
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	Learning material:	
	1. <i>Linux operating system user manual</i> , available on the Internet: https://help.ubuntu.com/community .	
	Learning supplies: Computer hardware, computer software.	
	Other resources: -	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	<p>Kaupo Nõlvak</p> <p>Ege Meister</p>	

MODULE “OPERATING SYSTEMS “DESCRIPTION

Purpose of module: *(acquired competence) to acquire a competence in usage of Operating systems. (The purpose is defined by one sentence and corresponds with the target competence).*

Module title	Operating systems	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	4 credits	
Preparation required for learning	Network administration Project management	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Operating systems administration and management	<p>1.1. Topic. Operating systems.</p> <p><i>Tasks:</i></p> <p>1.1.1. Understanding basic principles of the operating system and the extent of its usage.</p> <p>1.1.2. Operating system developments</p> <p>1.1.3. Different installation setup possibilities</p> <p>1.1.4. User management and groups</p> <p>1.1.5. Operating system services and their functions</p> <p>1.1.6. Administration of mobile devices</p> <p>1.1.7. Using cloud service for device</p>	<p>Satisfactory:</p> <p>Practical solution working. In documentation are used understandable language and terminology.</p> <p>Good:</p> <p>Practical solution working and have been used best practices. Selected technologies in project are justified. In documentation are used under-</p>

	<p>management</p> <p>1.1.8. DHCP server setup</p> <p>1.1.9. Active Directory service</p> <p>1.1.10. File- and print server setup</p> <p>1.1.11. Security updates and their management</p> <p>1.2.Topic. Project.</p> <p><i>Tasks:</i></p> <p>1.2.1. Making project plan</p> <p>1.2.2. Planning and executing infrastructure solution</p> <p>1.2.3. Project documentation.</p>	<p>standable language and terminology.</p> <p>Excellent:</p> <p>Practical solution working and have been used best practices. Selected technologies in project are justified. The practical realization of the project has been previously documented analysis of the selected technologies. In documentation are used understandable language and terminology.</p>
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	Learning material:	
	<ol style="list-style-type: none"> 1. Comptia Linux +, NDG Linux Essentials, https://www.lpi.org/ 2. Microsoft IT academy 3. Windows Serveri certification materials (exams 410, 411 ja 412 or similar) 	
	Learning supplies: Computer hardware, computer software.	
	Other resources: -	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	<p>Kaupo Nõlvak</p> <p>Ege Meister</p>	

MODULE “PROGRAMMING ENGINEERING“ DESCRIPTION

Purpose of module: *The doctrine is applied to a learner has an overview of the software development process and software development methodologies used and familiar with the relevant terminology.*

Module title	Programming engineering	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	4 credits (i.e. module scope in hours divided by one credit scope, e.g.: 100:25=4 credits).	
Preparation required for learning	Project management	
General competencies developed in the module	<p>Communication in the first (native) language;</p> <p>Communication in foreign languages;</p> <p>Mathematical competencies, basic competencies in science and technology;</p> <p>Digital literacy;</p> <p>Learning to learn;</p> <p>Social and citizenship skills;</p> <p>Initiative and entrepreneurship;</p> <p>Cultural awareness and expression.</p>	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
<p>Understand the nature of the software development process and models.</p> <p>Familiar with the basic steps of the software development process and development methods.</p> <p>Understands version control system nature</p>	<p>1.1. Topic. Software development process and models.</p> <p><i>Tasks:</i></p> <p>1.1.1. Software development process</p> <p>1.1.2. Software development process models</p> <p>1.1.3. Monumental methodologies</p> <p>1.1.4. Different agile methodologies</p> <p>1.1.5. The main stages of the software</p>	<p>Satisfactory:</p> <p>The project is realized; in the course of the project prepared an analysis of the course of the project the necessary work has been divided into different iterations. Non-functional and functional requirements are outlined. The analysis is</p>

<p>and importance.</p> <p>Knows CASE tools and their usage.</p> <p>Knows the basics of project management and understands the specific characteristics of the software development project.</p> <p>Is familiar with the various types of application architectures and types of specificities.</p> <p>Describes the testing of the principles of national and international testing standards.</p> <p>Prepare a test plan for the system.</p>	<p>development process (analysis, development, testing, implementation)</p> <p>1.1.6. Software development process management based on project size</p> <p>1.1.7. Basic stages of a comprehensive process</p> <p>1.1.8. Basic stages of involvement and work planning</p> <p>1.1.9. The choice of different methodologies, depending on the structure of the team and the user stories</p> <p>1.1.10. Version control system software for the development process</p> <p>1.1.11. Different control systems versions</p> <p>1.1.12. Introduction and use of Team Foundation Service. Work planning and the done work monitoring.</p> <p>1.1.13. GitHub</p> <p>1.1.14. Creating a different code branches for better code management</p> <p>1.1.15. Product delivery over to the customer</p> <p>1.1.16. Free software development process specifics</p> <p>1.1.17. Software Types</p> <p>1.1.18. The system software</p> <p>1.1.19. Application software</p> <p>1.1.20. The processes occurring in software using for visualization the CASE tools.</p> <p>1.1.21. Software testing basics of necessity</p> <p>1.1.22. Different levels of testing: a modular, integration, system and acceptance testing</p> <p>1.1.23. Different types of testing: functional, non-functional, architectural and regression testing</p> <p>1.2.Topic. Project.</p> <p><i>Tasks:</i></p> <p>1.2.1. Making project plan</p> <p>1.2.2. Planning and executing software solution</p>	<p>generally consistent with the user stories. CASE tools are used and the various processes are modelled. There are created user stories. In documentation are used understandable English terminology</p> <p>Good:</p> <p>For project is prepared a comprehensive analysis and with documentation is created user stories. Analysis software project is sufficient input to solve the problem set in the user stories. The project plan includes the buffers. In the documentation is correctly used English terminology.</p> <p>Excellent:</p> <p>In the project is executed with the created software in the analysis of the functional and non-functional requirements. In the software processes and workflows are visualized. Created project plan is divided into logical and useful resource iterations are planned. Buffers are used. In the documentation is correctly used English terminology.</p>
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	1.2.3. Project documentation	
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation.	
Material resources	Learning material:	
	<ol style="list-style-type: none"> 1. D. Pilone, Head First Software Development, 2008 2. http://www.istqb.org/downloads/finish/16/15.html 	
	Learning supplies: Computer class	
	Other resources: -	
Teachers' qualification	Profession teacher with the following qualifications: <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <i>Or:</i> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	Kaupo Nõlvak Ege Meister	

MODULE “**HARDWARE AND PERIPHERAL DEVICES**” DESCRIPTION

Purpose of the module: *Official certificate confirming a passed exam.*

Module title	Hardware and peripheral devices	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	2 credits	
Preparation required for learning	Higher primary school	
General competencies developed in the module	Computer construction and maintenance. Peripheral devices configuration and maintenance.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Identifying typical computer components, assembling / enlarging a computer unit using typical components.	<p>1.1. Elementary digital devices: logical gates, flip-flops.</p> <p>1.2. Personal computer components and architecture.</p> <p>1.3. Motherboards – components:</p> <ul style="list-style-type: none"> • buses: FSB, RAM bus, PCI, PCI-Express, AGP, ATA, SATA, ATAPI; • chipset: north and south bridges and their roles; • super I/O system and its controllers; • sockets: types and parameters; • IRQ system: definition and principle of operation; • DMA: principle of operation; • I/O ports: serial: PS/2, RS232, USB; parallel: LPT; • BIOS: structure, role and configuration. 	<p>Student should be able to / know:</p> <p>Satisfactory:</p> <ol style="list-style-type: none"> 1. identify a computer components graphical symbols; 2. identify and compare technical parameters of computer components; <p>Good:</p> <ol style="list-style-type: none"> 3. assembly a computer main unit according to given configuration; 4. configure BIOS; 5. verify the assembly correctness using the POST test; <p>Excellent:</p> <ol style="list-style-type: none"> 6. reassembly and / or

	<p>1.4. Motherboards – types: standard ATX, micro ATX, min ITX, nano ITX, pico ITX.</p> <p>1.5. Memory: 1.5.1. Types, architecture and principle of operation; 1.5.2. modules.</p> <p>1.6. CPU: 1.6.1. components: microprocessor, buses controller, system clock, memory, I/O ports, data, address and control buses, registers; 1.6.2. architecture: CISC, RISC; 1.6.3. work modes: real, protected and virtual.</p> <p>1.7. Graphic cards: 1.7.1. components: <ul style="list-style-type: none"> • GPU; • RAM; • RAMDAC; • PCI, AGP, PCI-Express interface; • D-SUB, DVI outputs; 1.7.2. architecture and functions.</p> <p>1.8. Hard drives: 1.8.1. construction and principle of operation; 1.8.2. types of hard drives: ATA, SATA, SSD. 1.8.3. possible RAID configuration.</p> <p>1.9. Optic drives: 1.9.1. types: CD-ROM drives, DVD-ROM drives, Blue Ray drives; 1.9.2. media: CD R and RW, DVD R and RW, Blue ray.</p>	<p>enlarge a computer unit using elements fitted to actual unit configuration;</p>
<p>Preparing, configuring and maintaining peripheral computer devices.</p>	<p>2.1. Monitors: 2.1.1. types: CRT and LCD monitors; 2.1.2. connection to the computer: DVI, D-Sub.</p>	<p>Student should be able to / know: Satisfactory: 1. prepare a peripheral device to work and</p>

	<p>2.2. Pointing devices:</p> <p>2.2.1. keyboard: principle of operation and types (contact, capacitive);</p> <p>2.2.2. mouse: principle of operation and types (mechanical, optical, laser, IR);</p> <p>2.2.3. graphical tablet: principle of operation and types.</p> <p>2.3. Printers:</p> <p>2.3.1. needle: principle of operation and application;</p> <p>2.3.2. ink-jet: principle of operation and application;</p> <p>2.3.3. laser: principle of operation and application;</p> <p>2.3.4. thermal: principle of operation and application;</p> <p>2.3.5. plotter: principle of operation and application;</p> <p>2.4. Scanners:</p> <p>2.4.1. flat: principle of operation and application;</p> <p>2.4.2. drum: principle of operation and application;</p> <p>2.4.3. handheld: principle of operation and application;</p>	<p>connect it to a computer unit;</p> <p>2. using documentation, identify consumable materials for various types of printers;</p> <p>3. supply the printer with new consumable materials;</p> <p>4. rules of disposal of consumables;</p> <p>Good:</p> <p>5. select and install the proper drivers for various peripheral devices;</p> <p>Excellent:</p> <p>6. perform the maintenance of peripherals.</p>
Recommended learning methods	Individual exercises, group (max 3 students) project.	
Material resources	<p>Learning material: Handbooks suitable for the module content.</p> <p>Learning supplies: Each student should have for his disposition: PC computer with a testing software, presentational applications (e.g. MS Office), set of tools (screwdrivers, pliers etc.) and components allowing to assemble a computer, tools for diagnosing of computer physical failures (meters, cables etc.).</p> <p>Other resources: technical documentation of used computer components.</p>	
Teachers' qualification	<p>MSc with pedagogical preparation</p> <p>Higher education diploma in ICT</p>	
Module organizers	Wojciech S. Wawrzyńczak	

MODULE “TECHNICAL PROJECT“ DESCRIPTION

Purpose of module: *To integrate knowledge acquired in all previous modules through a project that involves all stages from conception to design, without implementation*

Module title	Technical project	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	7 credits	
Preparation required for learning	To have all remaining modules passed	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression;	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
To identify the needs of the IT sector, relating them with the standard projects that may satisfy them.	<p>1.1. Topic. Project concept. <i>Tasks:</i> 1.1.1. To analyse the client general needs 1.1.2. To analyse the current systems 1.1.3. To determine the scope of the project 1.1.4. To describe the project</p> <p>1.2. Topic. Requirements engineering <i>Tasks:</i> 1.2.1. To elicitate and to analyse detailed</p>	<p>Satisfactory: Tasks are developed within a fictional, easy project</p> <p>Good: Tasks are developed within a project that could be used in practise</p>

	<p>requirements.</p> <p>1.2.2. To determine functional and non-functional requirements.</p> <p>1.2.3. To determine user requirements.</p> <p>1.2.4. To determine system requirements.</p> <p>1.2.5. To determine interface requirements.</p> <p>1.2.6. To develop a feasibility study.</p> <p>1.2.7. To validate the requirements.</p>	<p>Excellent:</p> <p>Tasks are developed within a real project, with the help real possible customers</p>
<p>To design technical projects related to the competences described in the diploma, including and developing their constituting stages.</p>	<p>2.1. System design</p> <p><i>Tasks:</i></p> <p>2.1.1. To develop context models.</p> <p>2.1.2. To design a behavioural model.</p> <p>2.1.3. To design system models.</p> <p>2.1.4. To design networking models.</p> <p>2.1.5. To design software models: data, processes, objects & user interface.</p>	<p>Satisfactory:</p> <p>Tasks are developed within a fictional, easy project</p> <p>Good:</p> <p>Tasks are developed within a project that could be used in practise</p> <p>Excellent:</p> <p>Tasks are developed within a real project, with the help real possible customers</p>
<p>To plan the project implementation, determining the intervention plan and associated documentation.</p>	<p>3.1. Project management</p> <p><i>Tasks:</i></p> <p>3.1.1. To plan the project.</p> <p>3.1.2. To schedule the project.</p> <p>3.1.3. To identify resources (computers, developers, software...).</p> <p>3.1.4. To assess risks.</p>	<p>Satisfactory:</p> <p>Tasks are developed within a fictional, easy project</p> <p>Good:</p> <p>Tasks are developed within a project that could be used in practise</p> <p>Excellent:</p> <p>Tasks are developed within a real project, with the help real possible customers</p>

<p>To define the procedures for the monitoring and control of the project implementation, justifying the selection of variables and instruments used.</p>	<p>4.1. Project implementation</p> <p><i>Tasks:</i></p> <p>4.1.1. To determinate control quality instruments</p> <p>4.1.2. To choose evaluation tools</p> <p>4.1.3. To design the change management (i.e., periodicity of new versions)</p>	<p>Satisfactory:</p> <p>Tasks are developed within a fictional, easy project</p> <p>Good:</p> <p>Tasks are developed within a project that could be used in practise</p> <p>Excellent:</p> <p>Tasks are developed within a real project, with the help real possible customers</p>
<p>Recommended learning methods</p>	<p>The project could be a single or collective work, but always conducted by a mentor.</p> <p>The student should start with a project proposal, to be assessed by the mentor or a team of teachers, taking into account its scope and size. Later on there should be interviews with the students to do a follow-up.. The students should be assigned tasks in each meeting up to the completion of the project.</p> <p>If possible, the project should be related to the business project (developed in the entrepreneurial skills module) where aspects like the economical feasibility and the business liability are going to be covered.</p> <p>Once the student has finished his/her work, the project should be exposed with the help of a projector to the mentor and, if possible, to an examining board. The student will be assigned certain amount of time to do it.</p>	
<p>Material resources</p>	<p>Learning material: project developed in previous courses and/or projects offered by related businesses</p> <hr/> <p>Learning supplies:</p> <ul style="list-style-type: none"> - Projector. - Student's own computer. - Presentation program (power point or the like). 	

	Other resources:
Teachers' qualification	Higher education diploma in ICT and completed authorised course in pedagogy and psychology.
Module organizers	Susana Valero, Vicente Tatay, Merche Arráez, Manuel M ^a Villapecelin

MODULE “WEB DEVELOPMENT” DESCRIPTION

Purpose of module: *Official certificate confirming a passed exam common with “Web 2 IT system administration” module.*

Module title	Web development	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	2 credits	
Preparation required for learning	Higher primary school After completing modules concerning classical programming.	
General competencies developed in the module	Preparation, maintenance and service of interactive webpages.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Creating various scripts performed at the client site using JavaScript interpreter.	<p>1.1. Short introduction to JavaScript as a programming language: genesis, destiny, application, usable tools (Adobe Dreamweaver, NetBeans etc.), ways to place a scripts in webpage body, differences between JavaScript and Java.</p> <p>1.2. Language structure:</p> <p>1.2.1. instructions and data types specific to the language: variable naming conventions, available data types, ways to variable declaration;</p> <p>1.2.2. available operators and their priority;</p> <p>1.2.3. conditional statements and loops – comparison with classical programming languages;</p> <p>1.2.4. lexical script structure and reserved words;</p> <p>1.2.5. using HTML tags in a script body;</p>	<p>Students should be able to / know:</p> <p>Satisfactory:</p> <ol style="list-style-type: none"> 1. install and configure applications used to write scripts in various programming languages; 2. install and configure tools necessary to create and maintain dynamic webpages; 3. configure servers and browsers to work with Internet applications; 4. built-in data types, constants, frequently used functions and objects properties and methods in selected

	<p>1.2.6. compatibility of certain instructions with XHTML standard (document.write).</p> <p>1.3. Objects:</p> <p>1.3.1. creating ways;</p> <p>1.3.2. properties and methods;</p> <p>1.3.3. access ways to object components.</p> <p>1.3.4. global object.</p> <p>1.4. Functions:</p> <p>1.4.1. functions and variable scope;</p> <p>1.4.2. built-in functions;</p> <p>1.4.3. functions as objects;</p> <p>1.4.4. functions as function arguments;</p> <p>1.4.5. functions as an object properties.</p> <p>1.5. Constructors and prototypes:</p> <p>1.5.1. creating objects using constructors;</p> <p>1.5.2. creating prototypes and manipulating them.</p> <p>1.6. Arrays:</p> <p>1.6.1. ways to creating arrays (classical and using constructor);</p> <p>1.6.2. data read from and write to an array;</p> <p>1.6.3. array properties and array indexing;</p> <p>1.6.4. array operations;</p> <p>1.7. Document Object Model (DOM):</p> <p>1.7.1. web browser main objects and their methods: window, document, history, location, navigator.</p> <p>1.7.2. accessing web page components using DOM and JavaScript.</p> <p>1.8. Events:</p> <p>1.8.1. introduction;</p> <p>1.8.2. common events.</p> <p>1.9. Web page components (buttons, text boxes and areas, radio buttons, check boxes, lists) and using them with JavaScript.</p>	<p>programming languages;</p> <p>5. define the concepts of basic built-in data types;</p> <p>6. apply variable declarations in relation to the built-in data types;</p> <p>Good:</p> <p>7. use built-in data types in selected programming languages;</p> <p>8. design a program structure in terms of necessary instructions, procedures and functions (methods);</p> <p>9. identify and use operators to write various expressions;</p> <p>10. define and maintain objects;</p> <p>11. create simple scripts maintaining data and forms both on client or server side;</p> <p>Excellent:</p> <p>12. use different methods to authenticate connections to the database;</p> <p>13. use scripts to build interfaces of web applications;</p> <p>14. publish application files on remote servers.</p>
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	<p>1.10. Forms:</p> <p>1.10.1. creating and accessing a form;</p> <p>1.10.2. properties and methods of a form object;</p> <p>1.10.3. form validation.</p> <p>1.11. Cookies:</p> <p>1.11.1. what cookie consists of;</p> <p>1.11.2. how cookie works;</p> <p>1.11.3. reading and writing cookies using JavaScript.</p> <p>1.12. Date and time objects, their properties and methods in JavaScript.</p>	
<p>Creating various scripts performed at the server site using PHP interpreter.</p>	<p>2.1. Short introduction to PHP as a programming language: genesis, destiny, application, usable tools (LAMP, WAMP etc.), ways to place a scripts in webpage body.</p> <p>2.2. Installation and configuration:</p> <p>2.2.1. installation on UNIX (Linux) systems;</p> <p>2.2.2. installation on Windows systems;</p> <p>2.2.3. configuration file structure.</p> <p>2.3. Language structure:</p> <p>2.3.1. instructions and data types specific to the language: variable naming conventions, available data types, ways to variable declaration;</p> <p>2.3.2. available operators and their priority;</p> <p>2.3.3. conditional statements and loops – comparison with classical programming languages;</p> <p>2.3.4. lexical script structure and reserved words.</p> <p>2.4. Classes and objects – declaring, using and maintaining.</p> <p>2.5. User and built-in functions.</p> <p>2.6. PHP and MySQL:</p> <p>2.6.1. PHPMyAdmin tool;</p> <p>2.6.2. connecting PHP and MySQL data-</p>	<p>Students should be able to / know:</p> <p>Satisfactory:</p> <ol style="list-style-type: none"> 1. install and configure applications used to write scripts in various programming languages; 2. install and configure tools necessary to create and maintain dynamic webpages; 3. configure servers and browsers to work with Internet applications; 4. built-in data types, constants, frequently used functions and objects properties and methods in selected programming languages; 5. define the concepts of basic built-in data types; 6. apply variable declarations in relation to the built-in data types; <p>Good:</p>

	<p>base;</p> <p>2.6.3. fetching functions;</p> <p>2.6.4. creating MySQL databases with PHP;</p> <p>2.6.5. creating queries with PHP;</p> <p>2.6.6. managing MySQL database with PHP: displaying data with HTML tables, building forms for queries.</p>	<p>7. use built-in data types in selected programming languages;</p> <p>8. design a program structure in terms of necessary instructions, procedures and functions (methods);</p> <p>9. identify and use operators to write various expressions;</p> <p>10. define and maintain objects;</p> <p>11. create simple scripts maintaining data and forms both on client or server side;</p> <p>Excellent:</p> <p>12. use different methods to authenticate connections to the database;</p> <p>13. use scripts to build interfaces of web applications;</p> <p>14. publish application files on remote servers.</p>
Recommended learning methods	Individual exercises, group (max 3 students) project.	
Material resources	Learning material: Handbooks suitable for the module content.	
	Learning supplies: Each student should have for his disposition: PC computer with an appropriate software allowing to write and test written scripts, presentational applications (e.g. MS Office).	
	Other resources: Student's computer should be connected with a test web server.	
Teachers' qualification	MSc with pedagogical preparation Higher education diploma in ICT	
Module organizers	Wojciech S. Wawrzyńczak	

MODULE “WEB 2 IT SYSTEMS ADMINISTRATION” DESCRIPTION

Purpose of module: *Official certificate confirming a passed exam common with “Web development” module.*

Module title	Web 2 IT systems administration.	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	2 credits	
Preparation required for learning	Higher primary school After completing modules concerning classical programming and web development.	
General competencies developed in the module	Maintenance and service of various Web 2 IT systems.	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Installing, configuring, administration and managing Moodle environment.	<p>1.1. Introduction: system description, genesis, destiny, application, useful tools (SCORM generators etc.).</p> <p>1.2. Site administration:</p> <p>1.2.1. user accounts: new user account creation, user accounts managing;</p> <p>1.2.2. enrolment methods: manual, self-enrolment, e-mail based enrolment, guest access;</p> <p>1.2.3. language configuration: language packs, language customization;</p> <p>1.2.4. roles and permissions: context and roles; standard roles;</p> <p>1.2.5. front page layout and themes;</p> <p>1.2.6. courses backup and restore methods.</p> <p>1.3. Course administration:</p>	<p>Students should be able to / know:</p> <p>Satisfactory:</p> <ol style="list-style-type: none"> 1. install Moodle environment on the web server and configure it for the first use; 2. configure various enrolment methods; give appropriate permissions for registered users; 3. configure front page layout and install language packs; <p>Good:</p> <ol style="list-style-type: none"> 4. create courses and assembly them into

	<p>1.3.1. courses groups and grouping;</p> <p>1.3.2. roles and permissions in a course;</p> <p>1.3.3. course completion tracking;</p> <p>1.3.4. logs of a course activity managing: activity reports, participation reports, course completion reports, participant's activity reports;</p> <p>1.3.5. gradebook: managing grades, grade scales, outcomes reports.</p> <p>1.4. Course creation:</p> <p>1.4.1. creating a new course: adding, configuration, deleting;</p> <p>1.4.2. course home page layout and blocks setting;</p> <p>1.4.3. resources: page, books, URLs, files, folders;</p> <p>1.4.4. activities: forums, chat, glossary, wiki;</p> <p>1.4.5. questions and a question bank: category set up and management, sharing a question bank, question types and behaviours;</p> <p>1.4.6. using SCORMs.</p>	<p>previously defined groups;</p> <p>5. manage courses: define grade scales, create reports on users activity and outcomes reaching;</p> <p>6. create and manage course activities of various types: forum, chat, glossary, wiki.</p> <p>Excellent:</p> <p>7. use SCORM generators for implementing courses from various sources;</p> <p>8. archive several courses and whole Moodle environment;</p>
<p>Installing, configuring, administration and managing WordPress environment.</p>	<p>2.1. Introduction: system description, genesis, destiny, application, useful tools (easyPHP, WAMP, XAMP, FTP clients etc.).</p> <p>2.2. System installation:</p> <p>2.2.1. installation on a local www server: Apache, PHP and MySQL servers installation (WAMP, XAMP, easyPHP or something else), database creation;</p> <p>2.2.2. installation on a remote www server: moving WordPress files to the server using FTP or SSH, database creation;</p> <p>2.2.3. system configuration: language selection, database configuration, final settings (e-mail address, password, privacy settings).</p> <p>2.3. System administration:</p> <p>2.3.1. the cockpit and its function;</p>	<p>Students should be able to / know:</p> <p>Satisfactory:</p> <p>1. choose an appropriate additional servers pack (WAMP, XAMP, LAMP) and FTP clients;</p> <p>2. install and configure additional servers (Apache, MySQL and PHP) on a local computer;</p> <p>3. correctly install and configure MySQL database;</p> <p>Good:</p> <p>4. install WordPress on a</p>

	<p>2.3.2. cockpit customization;</p> <p>2.3.3. content of the administration panel;</p> <p>2.3.4. system actualization.</p> <p>2.4. System using:</p> <p>2.4.1. entries: new entry, entry structure (title, content, “read more...” section, trackback, discussion), entry states;</p> <p>2.4.2. built-in editor functions;</p> <p>2.4.3. multimedia in entries: pictures and picture galleries, audio and video files, inserting files from a disk or URL, links to YouTube, Twitter or Facebook;</p> <p>2.4.4. entries revisions and managing: retrieving, moving and deleting;</p> <p>2.4.5. entry categories and tags: creating and managing;</p> <p>2.4.6. multimedia managing: adding, moving and deleting;</p> <p>2.4.7. pages: adding, managing and deleting;</p> <p>2.4.8. comments: answering, managing and deleting;</p> <p>2.4.9. themes: adding through administration panel and through FTP, sidebar widgets, custom menu, theme edition;</p> <p>2.4.10. plugins: new plugins download, edition, maintenance and update;</p> <p>2.4.11. users: adding new, roles and permissions, self-registration, managing;</p> <p>2.4.12. system tools: entries import and export.</p> <p>2.5. System security.</p>	<p>local computer and on a remote www server;</p> <p>5. configure WordPress environment for the first use; add users with appropriate roles and permissions;</p> <p>6. manage WordPress using cockpit and administration panel;</p> <p>Excellent:</p> <p>7. add entries, pages and multimedia, customize themes, add plugins;</p> <p>8. archive and update WordPress, plugins etc.;</p>
<p>Installing, configuring, administration and managing Joomla environment.</p>	<p>3.1. Definition of CMS; structure of CMS – front end and back end.</p> <p>3.2. Installation:</p> <p>3.2.1. remote www server installation process;</p> <p>3.2.2. local www server installation pro-</p>	<p>Students should be able to / know:</p> <p>Satisfactory:</p> <p>1. install Joomla on a local computer and on a remote www server;</p>

	<p>cess: Windows family systems; Unix family systems;</p> <p>3.2.3. PHP server configuration;</p> <p>3.2.4. MySQL server configuration: database creation and setting up.</p> <p>3.3. Back end environment customization and configuration: menus, icons, tabs.</p> <p>3.4. Front end environment customization: page elements (modules, templates).</p> <p>3.5. Content management tools:</p> <p>3.5.1. tools in tools panel;</p> <p>3.5.2. info bar and workspace;</p> <p>3.5.3. global configuration area tabs: site, locale, content, database, server, metadata, mail, cache, statistics, SEO;</p> <p>3.5.4. managers: language, template, multimedia, trash, user, menu, sections, categories, front page;</p> <p>3.5.5. preview area customization;</p> <p>3.6. Components, modules and categories:</p> <p>3.6.1. components installation and uninstallation;</p> <p>3.6.2. component, category and modules types: banners, contacts, mass mail, news feeds, polls, RSS syndicates, Web links, administrator;</p> <p>3.7. User templates creating and managing.</p>	<p>2. customize back end (menus, icons, tabs) and front end environment (pages elements, modules, templates);</p> <p>Good:</p> <p>3. manage Joomla using global configuration area tools;</p> <p>4. use various components and modules;</p> <p>Excellent:</p> <p>5. create and manage user templates;</p> <p>6. archive and update Joomla.</p>
Recommended learning methods	Individual exercises, group (max 3 students) project.	
Material resources	<p>Learning material: Handbooks suitable for the module content.</p> <p>Learning supplies: Each student should have for his disposition: PC computer with an appropriate software (Moodle, Joomla, WordPress, WAMP, XAMP, FTP client, SCORM generators), presentational applications (e.g. MS PowerPoint).</p> <p>Other resources: Student's computer should be connected with a test</p>	

	web server.
Teachers' qualification	MSc with pedagogical preparation Higher education diploma in ICT
Module organizers	Wojciech S. Wawrzyńczak

MODULE “PROGRAMMING ALGORITHMS AND METHODS“ DESCRIPTION

Purpose of module: (*acquired competence*)

- *To distinguish between the types of algorithm structures*
- *Read the algorithm*
- *To develop and evaluate the algorithm*
- *To develop the algorithm in one of the programming languages*

Module title	Programming algorithms and methods	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	3 credit (75 hours)	
Preparation required for learning	-	
General competencies developed in the module	<p>Communication in the first (native) language;</p> <p>Communication in foreign languages;</p> <p>Mathematical competencies, basic competencies in science and technology;</p> <p>Digital literacy;</p> <p>Learning to learn;</p> <p>Social and citizenship skills;</p> <p>Initiative and entrepreneurship;</p> <p>Cultural awareness and expression;</p> <p>Being able to record and evaluate the algorithm independently and find the necessary structures to solve simple tasks</p> <p>Being able to independently describe the program operation algorithm for simple tasks</p> <p>Being able to record the algorithm in one of the programming languages</p>	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
1. Notion of algorithm	1.1. Topic. Notion of algorithm	Satisfactory: Comprehending the notion of

		<p>algorithm</p> <p>Good: Comprehending different algorithm structures</p> <p>Excellent: Is able to describe notion of algorithm and algorithm performers.</p>
2. Structure of algorithm and diagrams	<p>2.1. Topic. Structures of algorithms, their development/designing using Flow diagrams</p> <p><i>Tasks:</i></p> <p>2.1.1. Flow diagrams basics</p> <p>2.1.2. Constructing diagrams</p>	<p>Satisfactory: Comprehending different algorithm structures</p> <p>Good: Is able to classify and describe algorithms</p> <p>Excellent: Knowing how to create flow diagrams</p>
3. Algorithms in programming	<p>3.1. Topic. Developing simple algorithms and their implementation in programming language/language code</p> <p><i>Tasks:</i></p> <p>3.1.1. Programming language syntax</p>	<p>Satisfactory: Comprehending simple algorithm structures</p> <p>Good: Being able to write main part of the algorithm in one programming language</p> <p>Excellent: Being able to write algorithm in one/many programming language without computer</p>
4. Programming basics	<p>4.1. Topic. Programming basics</p> <p><i>Tasks:</i></p> <p>4.1.1. Elementary algorithms</p> <p>4.1.2. Program development</p>	<p>Satisfactory: Comprehending the basics programming algorithms and can describe it</p> <p>Good: Be able to create flow diagram of elementary algorithms</p> <p>Excellent: Be able to realize program with elementary algorithm</p>

5. Loops	<p>5.1. Topic. Loop algorithms</p> <p><i>Tasks:</i></p> <p>5.1.1. Loops with preconditions</p> <p>5.1.2. Loops with the following conditions</p>	<p>Satisfactory: Comprehending the notion of loop algorithms</p> <p>Good: Comprehending differences between different type of loop algorithms and is able to describe them</p> <p>Excellent: being able to realize any of them in any programming language</p>
6. Arrays	<p>6.1. Topic. Arrays</p> <p><i>Tasks:</i></p> <p>6.1.1. Simple arrays</p> <p>6.1.2. two-dimensional arrays</p> <p>6.1.3. multidimensional arrays</p>	<p>Satisfactory: Comprehending the notion of array</p> <p>Good: Comprehending different type of array and being able to describe them</p> <p>Excellent: being able to realize arrays in any programming language</p>
Recommended learning methods	Lecture, seminar, group work, discussion, brainstorm	
Material resources	<p>Learning material:</p> <ul style="list-style-type: none"> • Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest (2009). Introduction to Algorithms, 3rd Edition. MIT Press ISBN-13: 978-0262033848 • Steven S Skiena. The Algorithm Design Manual 2nd ed.(2008), Springer-Verlag, ISBN: 978-1-84800-069-8 • Robert Sedgwick, Kevin Wayne. Algorithms 4th Edition (2011), Pearson Education, Inc. ISBN-13: 978-0-321-57351-3 <p>Learning supplies:</p> <p>Computer class with computers;</p> <p>MS Visio;</p> <p>Programming language.</p>	

	<p>Other resources:</p> <p>Projector or interactive board</p> <p>Robots (optional)</p>
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <p>Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology.</p>
Module organizers	<p>Jevgenijs Kruzkovs</p> <p>Guntis Springis</p> <p>Vladimirs Kožanovs</p> <p>Tatjana Jaunzeme</p>

MODULE “PROJECT MANAGEMENT“ DESCRIPTION

Purpose of module: (*acquired competence*)

- *To provide professional competences shaping with regard to project work performance in automation and informatization of application processes and IT project management/administration in new IT system creation and maintenance*

Module title	Project management
Module code	Not applicable
LTKS(LTqualification standards) level	IV
Volume of credits	2 credits (50 hours).
Preparation required for learning	-
General competencies developed in the module	<p>Communication in the first (native) language;</p> <p>Communication in foreign languages;</p> <p>Mathematical competencies, basic competencies in science and technology;</p> <p>Digital literacy;</p> <p>Learning to learn;</p> <p>Social and citizenship skills;</p> <p>Initiative and entrepreneurship;</p> <p>Cultural awareness and expression;</p> <p>The ability to work out project development strategies, defining project development goals, effectiveness criteria and applicability restrictions</p> <p>The ability to work out new methods and techniques of information systems project development</p> <p>Being able to work out new technologies of information systems project development</p> <p>The ability to bring into action author’s supervision of design, implementation and maintenance/support information system and technologies processes</p> <p>The ability to organize cooperation between the groups of developers and customer, make managerial decisions under the conditions of different opinions</p>

	<p>Be aware of</p> <ul style="list-style-type: none"> providing information sub-system test design techniques composition and content of IT project documentation IT project risks and risk management practice assessment approaches of IT project cost efficiency <p>Be able to</p> <ul style="list-style-type: none"> handle IT project phase jobs, apply necessary tools for automation of project design work control over IT project progress of work work out IT project documentation <p>Have a command of</p> <ul style="list-style-type: none"> IT project control technology 	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
1. Project stage discovery and model analysis	<p>1.1. Topic. Project’s lifecycle. Project’s lifecycle in IT.</p> <p><i>Tasks:</i></p> <p>1.2. IT projects management methodologies.</p>	<p>Satisfactory: Comprehending lifecycle model stages (cascade, spiral etc.)</p> <p>Good: Being able to differentiate lifecycle model stages</p> <p>Excellent: Comprehending and differentiating and methodologies.</p>
2. The company's project organization structure	<p>2.1. Topic. Project environment.</p> <p><i>Tasks:</i></p> <p>2.1.1. Project and organizing structures of enterprise/business</p> <p>2.1.2. Rational Unified Process (RUP)</p> <p>2.1.3. Modeling language UML</p>	<p>Satisfactory: Organizing company's structure.</p> <p>Good: Be able to construct diagramm</p> <p>Excellent: Be able to differentiate diagram types.</p>
3. Project administration main areas	<p>3.1. Topic. The main areas of project administration knowledge</p> <p><i>Tasks:</i></p> <p>3.1.1. Projects team</p>	<p>Satisfactory: Comprehending the main areas of project administration.</p> <p>Good: Comprehending IT resources and is able to</p>

	3.1.2. Job structure 3.1.3. IT project resources 3.1.3. Project documentation	describe them Excellent: Comprehending the project documentation
4. Process management, management competencies	4.1. Topic The main groups of project administrative processes <i>Tasks:</i> 4.1.1. Project integration management 4.1.2. Project domain management 4.1.3. Project time management 4.1.4. Project cost management 4.1.5. Quality assurance management 4.1.6. Human resource management in the project 4.1.7. Project communication/networking management	Satisfactory: Being familiar with project administrative processes Good: Comprehending project integration, time management, cost budgeting and quality Excellent: Comprehending management, human resources and communication
5. Risk management	5.1. Topic. Project risks management	Satisfactory: Comprehending risks. Good: Being able to describe them Excellent: Knowing risks prevention techniques
Recommended learning methods	Lecture, seminar, group work, discussion, brainstorm, laboratory work	
Material resources	Learning material:	
	<ul style="list-style-type: none"> • Stanley E. Portny Project Management For Dummies, 2013 • Donald J. Scott Project Management: A Quick Start Beginner's Guide For The Serious Project Manager To Managing Any Project Easily 2016 • Harold Kerzner Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 2013 • Joseph Phillips: IT Project Management: On Track from Start to Finish, Third Edition • Kathy Schwalbe Information Technology Project Management 	
	Learning supplies: Computer class with computers; MS Project program;	

	BPWin (ERWin) program;
	Other resources: Projector or Interactive board
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <p>Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology.</p>
Module organizers	<p>Jevgenijs Kruzkovs</p> <p>Guntis Springis</p> <p>Vladimirs Kozanovs</p> <p>Tatjana Jaunzeme</p>

MODULE “COMPUTER LOGICS“ DESCRIPTION

Purpose of module: (*acquired competence*)

- To gain knowledge about data processing and the logical framework of a computer
- To gain knowledge and skills in building logic circuits and solving practical logical tasks

Module title	Computer logics	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	2 credits (50 hours).	
Preparation required for learning	Programming basics	
General competencies developed in the module	<p>Communication in the first (native) language;</p> <p>Communication in foreign languages;</p> <p>Mathematical competencies, basic competencies in science and technology;</p> <p>Digital literacy;</p> <p>Learning to learn;</p> <p>Social and citizenship skills;</p> <p>Initiative and entrepreneurship;</p> <p>Cultural awareness and expression;</p> <p>Ability to independently record and evaluate logic circuit for solving simple tasks;</p> <p>Ability to independently describe logical operation principles of programs for simple tasks;</p> <p>Ability to use the laws of logic to create logic circuits and to solve some tasks.</p>	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
1. Numbering system	<p>1.1. Topic. Numbering system</p> <p><i>Tasks:</i></p> <p>1.1.1. Binary</p>	<p>Satisfactory:</p> <p>Understand numbering systems and can classify them</p>

	<p>1.1.2. Octogonal</p> <p>1.1.3. Decimal</p> <p>1.1.4. Hexadecimal</p>	<p>Good:</p> <p>Be familiar with/ Know the computing system arithmetic operations</p> <p>Excellent: be able to perform arithmetic operations in different numbering systems</p>
2. Data encoding	<p>2.1.Topic. Data encoding and data processing on a computer</p> <p><i>Tasks:</i></p> <p>2.1.1. Representation of integer numbers</p> <p>2.1.2. Representation of real numbers</p> <p>2.1.3. Representation of negative numbers</p> <p>2.1.4. Arithmetic operations with encoded numbers</p>	<p>Satisfactory:</p> <p>Comprehending the data encryption process</p> <p>Good: Comprehending the data encryption process for different numbers</p> <p>Excelent: Is able to make arithmetics operations with encoded numbers</p>
3. Boolean algebra	<p>3.1. Topic. The basics of Boolean algebra</p> <p><i>Tasks:</i></p> <p>3.1.1.elementary logics functions</p> <p>3.1.2. Boolean algebra basic rules</p>	<p>Satisfactory: Know the basics of Boolean algebra</p> <p>Good: Comprehending elementary logics functions</p> <p>Excelent: Is able to use boolean algebra basic rules</p>
4. Combinational circuits	<p>4.1.Topic. Combinational circuits</p> <p><i>Tasks:</i></p> <p>4.1.1. Logocal elements</p> <p>4.1.2. Combinational circuits analyze</p> <p>4.1.3. Synthesis of combinational circuits</p> <p>4.1.4. Combinational circuits optimization</p>	<p>Satisfactory: Know combinational circuits structure</p> <p>Good: Know combinational circuits elements</p> <p>Excelent: Comprehending combinational circuits optimization</p>
5. Computer elements	<p>5.1. Topic. Elements and components of a computer</p>	<p>Satisfactory: Know the copmuter elements and components</p>

		<p>Good: Is able to classify computer elements and components</p> <p>Excelent: Comprehending of elements and components operations</p>
Recommended learning methods	Lecture, seminar, group work, discussion, brainstorm	
Material resources	<p>Learning material:</p> <ol style="list-style-type: none"> 1. <i>Ben-Ari, Mordechai (2003). Mathematical Logic for Computer Science (2nd ed.). Springer-Verlag. ISBN 1-85233-319-7.</i> 2. <i>Huth, Michael; Ryan, Mark (2004). Logic in Computer Science: Modelling and Reasoning about Systems (2nd ed.). Cambridge University Press. ISBN 0-521-54310-X.</i> 3. <i>Burris, Stanley N. (1997). Logic for Mathematics and Computer Science. Prentice Hall. ISBN 0-13-285974-2.</i> 4. <i>Hsu, John Y. (2002). Computer Logic. Design Principles and Applications.</i> 5. <i>Pearson Certification (2011). Computer Structure and Logic. Pearson IT Certification. ISBN: 9780132682831</i> 	
	<p>Learning supplies:</p> <ul style="list-style-type: none"> • Computer class with computers • MS Visio 	
	<p>Other resources:</p> <ul style="list-style-type: none"> • Projector or Interactive board 	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <p>Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology.</p>	
Module organizers	<p>Jevgenijs Kruzkovs</p> <p>Guntis Springis</p> <p>Vladimirs Kozanovs</p> <p>Tatjana Jaunzeme</p>	

MODULE “ECONOMICS AND BUSINESS BASICS“ DESCRIPTION

Purpose of module: *Know the economic environment, understand the competitive market and its structure*

Module title	Economics and business basics	
Module code	Not applicable	
LTKS(LT qualification standards) level	IV	
Volume of credits	2 credits	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary.	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression;	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Knowledge main economic course and production and international market	1.1.Topic. Economic Science subject and methods. <i>Tasks:</i> 1.1.1. People desire 1.1.2. Wish fulfillment of the chain 1.1.3. Resources 1.1.4. Shortage 1.1.5. Macroeconomics and Microeconomics	Satisfactory During the time not fully answer the questions. In response to additional questions overlooks the incomplete answer. Good During the time not fully

	<p>1.2.Topic. The market economy or free entrepreneurship.</p> <p><i>Tasks:</i></p> <p>1.2.1. Free Entrepreneurship pillars</p> <p>1.2.2. Models</p> <p>1.3.Topic. Demand</p> <p><i>Tasks:</i></p> <p>1.3.1. Demand and price effects</p> <p>1.3.2. The market offers</p> <p>1.3.3. Price elasticity of demand</p> <p>1.4.Topic. Supply</p> <p><i>Tasks:</i></p> <p>1.4.1. Supply and price effects</p> <p>1.4.2. The market offers</p> <p>1.4.3. Price elasticity of supply</p> <p>1.5.Topic. The market equilibrium price</p> <p><i>Tasks:</i></p> <p>1.5.1. The demand and supply together</p> <p>1.5.2. As the market stabilizes balance</p> <p>1.6.Topic. Business organization market conditions</p> <p><i>Tasks:</i></p> <p>1.6.1. As for becoming an businessman</p> <p>1.6.2. The strategy of varnish entrepreneurs</p> <p>1.6.3. Small business role in the economy</p> <p>1.6.4. Forms of business organization</p> <p>1.7.Topic.Business Financing</p> <p><i>Tasks:</i></p> <p>1.7.1. From savings to investment</p> <p>1.7.2. When businesses borrow</p> <p>1.7.3. When a company increases equity</p> <p>1.7.4. When businesses save</p> <p>1.8.Topic. International Trade</p> <p><i>Tasks:</i></p>	<p>answer the questions. In addition the questions answered correctly.</p> <p>Perfectly</p> <p>In the questions answered in a timely manner, without errors.</p>
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	1.8.1. Two-way street 1.8.2. International trade restrictions 1.8.3. The European Union 1.8.4. Globalization 1.9.Topic. Business plan	
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation	
Material resources	Learning material: Book- “Economics and business“, Lithuanian Junior Achievement. 2 parts.	
	Learning supplies: Theoretic and practical Books	
	Other resources: Computers, Projectors	
Teachers' qualification	Profession teacher with the following qualifications: <ul style="list-style-type: none"> Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <i>Or:</i> <ul style="list-style-type: none"> Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	Adomas Pakalnis	

MODULE “TECHNICAL BUSINESS FOREIGN LANGUAGES“ DESCRIPTION

Purpose of module: to acquire a competence in usage of Technical business foreign language.

Module title	Technical business foreign languages	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	3 credits	
Preparation required for learning	Applicable when basic skills of foreign language are necessary.	
General competencies developed in the module	Communication in foreign languages; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression;	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Ability to use special terminology and information sources in a foreign language.	<p>1.1. Topic. Computers Today <i>Tasks:</i> 1.1.1. Living in a digital age. 1.1.2. Computer essentials. 1.1.3. Buying a computer.</p> <p>1.2.Topic. Input/Output Devices. <i>Tasks:</i> 1.2.1. Choosing devices 1.2.2. Devices for the disabled.</p> <p>1.3. Topic. Storage Devices <i>Tasks:</i> 1.3.1. Magnetic storage 1.3.2. Optical storage</p>	<p>Satisfactory</p> <p>Able to talk about the chosen topic. Cannot fully answer the questions. In response to additional questions produces incomplete answers.</p> <p>Good</p> <p>Able to speak about a chosen topic. Cannot fully answer all the questions. Additional ques-</p>

	<p>1.3.3. Flash memory</p> <p>1.4. Topic. Basic Software</p> <p><i>Tasks:</i></p> <p>1.4.1. The operating system (OS)</p> <p>1.4.2. Word processing.</p> <p>1.4.3. Spreadsheets.</p> <p>1.4.4. Databases.</p> <p>1.5. Topic. Faces of the Internet</p> <p><i>Tasks:</i></p> <p>1.5.1. The Internet and email.</p> <p>1.5.2. The Web.</p> <p>1.5.3. Internet security.</p> <p>1.6. Topic. Creative Software</p> <p><i>Tasks:</i></p> <p>1.6.1. Graphics and design.</p> <p>1.6.2. Web design.</p> <p>1.6.3. Multimedia.</p> <p>1.7. Topic. Programming</p> <p><i>Tasks:</i></p> <p>1.7.1. Programming languages.</p> <p>1.8. Topic. Computers Tomorrow</p> <p><i>Tasks:</i></p> <p>1.8.1. Networks.</p> <p>1.8.2. Video games.</p> <p>1.8.3. New technologies.</p>	<p>tions are answered correctly.</p> <p>Perfect</p> <p>Able to speak about a chosen topic in detail. All questions are answered in a timely manner and without errors.</p>
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation	
Material resources	Learning material:	
	Learning supplies: Reference books on theory and practice.	
	Other resources: Computers, Projectors	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> Higher education diploma and completed authorised course in pedagogy and psychology. 	

	<p><i>Or:</i></p> <ul style="list-style-type: none">• Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology.
Module organizers	Aleksandra Balsienė

MODULE “WORK AND CIVIL SAFETY“ DESCRIPTION

Purpose of module: *To strengthen students' civil and worker safety systems understanding*

Module title	Work and civil safety	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	2 credits	
Preparation required for learning	Applicable in case when basic skills of previous modules are necessary	
General competencies developed in the module	Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression;	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
Knowledge of civil and labor safety rules	1.1. Topic. Civil safety <i>Tasks:</i> 1.1.1. Concept civil protection 1.1.2. Disaster preparedness 1.1.3. Naturally occurring hazards 1.1.4. Technical dangers 1.1.5. Social dangers 1.1.6. Population protection organization 1.1.7. Emergency Management 1.1.8. The introductory safety briefing 1.2. Topic. Work safety	Satisfactory During the time not fully answer the questions. In response to additional questions overlooks the incomplete answer. Good During the time not fully

	<p><i>Tasks:</i></p> <p>1.2.1. General knowledge of work safety normative legal regulation.</p> <p>1.2.2. Labour Relations and their legal regulation.</p> <p>1.2.3 Employers 'and workers' rights and obligations.</p> <p>1.2.4. Safety at Work enterprise organization.</p> <p>1.2.5. Electrical safety instructions</p> <p>1.2.6. Fire safety in the company.</p> <p>1.2.7. First aid</p> <p>1.2.8. Work hygiene.</p> <p>1.2.9. General requirements for the working environment and the workplace.</p> <p>1.2.10. Work safety working computer equipment</p>	<p>answer the questions. In addition the questions answered correctly.</p> <p>Perfectly</p> <p>In the questions answered in a timely manner, without errors.</p>
Recommended learning methods	Theory lectures, completion of practical tasks, project preparation	
Material resources	<p>Learning material:</p> <p>Webgraphy:</p> <p>http://ec.europa.eu/echo/what/civil-protection/mechanism_en</p> <p>https://osha.europa.eu/en/safety-and-health-legislation/european-directives</p> <p>Learning supplies: Theoretic and practical Books</p> <p>Other resources: Computers, Projectors</p>	
Teachers' qualification	<p>Profession teacher with the following qualifications:</p> <ul style="list-style-type: none"> • Higher education diploma in ICT and completed authorised course in pedagogy and psychology. <p><i>Or:</i></p> <ul style="list-style-type: none"> • Vocational training in ICT, 3 years work experience in the corresponding field, and completed authorised course in pedagogy and psychology. 	
Module organizers	Adomas Pakalnis	

MODULE “ENTREPRENEURIAL SKILLS“ DESCRIPTION

Purpose of module: *To obtain practice in a real environment where the student can apply all previous theoretical learnings*

Module title	Entrepreneurial skills	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	2 credits	
Preparation required for learning	None	
General competencies developed in the module	<p>Communication in the first (native) language; Communication in foreign languages; Mathematical competencies, basic competencies in science and technology; Digital literacy; Learning to learn; Social and citizenship skills; Initiative and entrepreneurship; Cultural awareness and expression.</p>	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
To recognize skills related to the entrepreneurial initiative, analyzing the requirements originated from job and business activities.	<p>1.1. Topic. The entrepreneur <i>Tasks:</i> 1.1.1. To describe what is the entrepreneurial spirit. 1.1.2. To recognize and to describe the features that characterize the entrepreneur, justifying why they are essential in the business world. 1.1.3. To analyze the skills, capabilities and attitudes of the entrepreneur. 1.1.4. To rate the entrepreneur as a develop-</p>	<p>Satisfactory: The student knows the concepts but does not feel an identification with them.</p> <p>Good: The student performs some research in real businesses.</p>

	<p>ment, innovation and social change agent.</p> <p>1.1.5. To discover one’s entrepreneurial skills and to acquire tools to strengthen and develop them.</p> <p>1.2. Topic. The business and its environment</p> <p><i>Tasks:</i></p> <p>1.2.1. To define the opportunity of creating a small enterprise, assessing the impact on the environment and incorporating ethical values.</p> <p>1.2.2. To identify what is a business and to classify its kinds.</p> <p>1.2.3. To discern the different factors that make the macro - and microenvironments.</p> <p>1.2.4. To performs analysis of the environment of a company using the SWOT matrix.</p> <p>1.2.5. To know what are the corporate culture and values and the relevance of a proper corporate image.</p> <p>1.2.6. To identify what is the social corporate responsibility and its main indicators.</p>	<p>Excellent:</p> <p>The student performs the first steps towards his own business idea.</p>
<p>To define the opportunity of creating a small business, and develop a market analysis incorporating ethical values.</p>	<p>2.1. Topic. Entrepreneurial idea</p> <p><i>Tasks:</i></p> <p>2.1.1. To know how to recognize a creative idea.</p> <p>2.1.2. To learn about the different methods to generate creative ideas.</p> <p>2.1.3. To differentiate an entrepreneurial idea from another that is not.</p> <p>2.1.4. To know the contents of a market research and how to carry it out.</p> <p>2.1.5. To develop a market research.</p> <p>2.1.6. To use information and communication technologies as a basic instrument both informative and supporting within the Marketing Plan.</p> <p>2.1.7. To make a suitable Marketing Plan for the business Project.</p>	<p>Satisfactory:</p> <p>The student knows the concepts but does not feel an identification with them.</p> <p>Good:</p> <p>The student does a market research.</p> <p>Excellent:</p> <p>The student offers his own business idea and develops all tasks relating to it.</p>
<p>To perform activities for the constitution and</p>	<p>3.1. Topic. The business legal shape</p> <p><i>Tasks:</i></p>	<p>Satisfactory:</p> <p>The student knows the</p>

<p>start up of a company, choosing the legal shape and identifying the associated legal obligations.</p>	<p>3.1.1. To differentiate the individual from the legal entity.</p> <p>3.1.2. To acquire the criteria to consider when choosing a legal shape for the business and the consequences of choosing one or other.</p> <p>3.1.3. To discover that the activity to which the business is engaged has certain legal implications.</p> <p>3.1.4. To know how to protect the ideas, the processes, the products and the brand of business.</p>	<p>concepts but does not feel an identification with them.</p> <p>Good: The student studies several real businesses.</p> <p>Excellent: The student studies the legal shape of his own business idea.</p>
<p>To undertake basic financial management of small and medium businesses, identifying the main accounting and tax obligations.</p>	<p>4.1. Topic. The production and the business costs</p> <p><i>Tasks:</i></p> <p>4.1.1. To identify and classify the different types of costs.</p> <p>4.1.2. To define and to calculate the return of interest point.</p> <p>4.1.3. To carry out a detailed costs analysis for the business project.</p> <p>4.2. Topic. Investment and financing plan</p> <p><i>Tasks:</i></p> <p>4.2.1. To know how to develop an investment plan.</p> <p>4.2.2. Make the amortisation schedule of the business fixed assets.</p> <p>4.2.3. To know the funding sources of a company, its classification and how to choose the most convenient.</p> <p>4.2.4. To distinguish between own and third party funding sources.</p> <p>4.2.5. To elaborate financing plan of a company</p> <p>4.3. Topic. Economical and financial feasibility analysis</p> <p><i>Tasks:</i></p> <p>4.3.1. To learn when a company has financial balance and how it should be its financial structure.</p>	<p>Satisfactory: The student knows the concepts but does not feel an identification with them.</p> <p>Good: The student successfully performs classroom tasks.</p> <p>Excellent: The student simulates his own business project.</p>

	<p>4.3.2. To understand the keys of a balance sheet and of a profit and loss account.</p> <p>4.3.3. To discover the information provided by the ratios about the financial situation of a business.</p> <p>4.3.4. To know what is the average period of maturation of a company and its usefulness.</p> <p>4.3.5. To appreciate the importance of developing a foresight balance, a profit and loss account and a treasury plan.</p> <p>4.3.6. To learn to develop a treasury plan.</p> <p>4.4. Topic. Tax and accounting obligations in the business</p> <p><i>Tasks:</i></p> <p>4.4.1. To define the tax liability of a business area companies.</p> <p>4.4.2. To differentiate different kinds of taxes and the tax calendar.</p> <p>4.4.3. To make a tax agenda to include it inside the business project.</p> <p>4.4.4. To define the accounting obligations of the company.</p>	
<p>To define the human resources.</p>	<p>5.1. Topic. Human resources in the business</p> <p><i>Tasks:</i></p> <p>5.1.1. To learn how to organize a small business.</p> <p>5.1.2. To distinguish different ways of organizing a business.</p> <p>5.1.3. To analyzes and to design workplaces and required professional profiles.</p> <p>5.1.4. To organize the work, recruitment and social security scheme for workers partners.</p> <p>5.1.5. To learn how to calculate the cost of a worker.</p> <p>5.1.6. To learn how to organize the process of selection, recruitment and training of the staff.</p>	<p>Satisfactory:</p> <p>The student knows the concepts but does not feel an identification with them.</p> <p>Good:</p> <p>The student successfully performs classroom tasks.</p> <p>Excellent:</p> <p>The student simulates his own business project.</p>
<p>Recommended learning methods</p>	<p>The following activities are proposed for the development of the contents:</p>	

	<p>1. Start activities, to remember and settle background knowledge and motivate students towards new learnings. The proposed activities are:</p> <ul style="list-style-type: none"> - Initial survey. - News newspaper or business journal commentary about any news related to the classroom current topic. - To launch a series of questions to make the student think about a certain subject. - Idea detection activities such as the debate or brainstorming. <p>2. Optional development activities towards 'good' assessment. Once exposed the theoretical contents of the unit, the students will be proposed different activities in order to develop them. The suggested activities are:</p> <ul style="list-style-type: none"> - To carry out case studies (choice of legal shape, questionnaire-based market research, competitive analysis ..., etc.). - Information research on websites and journals. - To find information about business creation processes (business laboratory, Chamber of Commerce offices, bank funding...). <p>3. Optional continuity activities (business project developing) towards 'excellent' assessment, which will take place throughout the course and will integrate all the units, paying special attention to the unit dedicated to the business project development.</p>
Material resources	<p>Learning material: business creation web pages (depending on each country and region). For example: http://www.ipyme.org/es-ES/creaciondelaempresa/Paginas/Creaciondelaempresa.aspx</p>
	<p>Learning supplies:</p> <ul style="list-style-type: none"> - Projector slides - Selected business news - Questionnaire models - Business plan models
	<p>Other resources:</p>
Teachers' qualification	Higher education diploma in ICT and completed authorised course in pedagogy and psychology.
Module organizers	Susana Valero, Vicente Tatay, Merche Arráez, Manuel M ^a Villapecelin

MODULE “INTERNSHIP“ DESCRIPTION

Purpose of module: *To obtain practice in a real environment where the student can apply all previous theoretical learnings*

Module title	Internship	
Module code	Not applicable	
LTKS (LT qualification standards) level	IV	
Volume of credits	8	
Preparation required for learning	To have all remaining modules passed, except, ‘Technical project’	
General competencies developed in the module	<p>Communication in the first (native) language;</p> <p>Communication in foreign languages;</p> <p>Mathematical competencies, basic competencies in science and technology;</p> <p>Digital literacy;</p> <p>Learning to learn;</p> <p>Social and citizenship skills;</p> <p>Initiative and entrepreneurship;</p> <p>Cultural awareness and expression.</p>	
<i>Module learning results (itemized competence)</i>	<i>Recommended content for achievement of desirable results</i>	<i>Learning results assessment criteria (evaluation)</i>
To identify the structure and organization of the company relating to the production and marketing products and services offered.	<p>1.1. Topic. Identification of the structure and organization of the business</p> <p><i>Tasks:</i></p> <p>1.1.1. To identify organizational structure of the company and functions of each area.</p> <p>1.1.2. To identify elements that make up the logistics network of the suppliers, customers, systems production and storage, among others.</p> <p>1.1.3. To identify the production process.</p> <p>1.1.4. To identify human resources com-</p>	<p>Satisfactory:</p> <p>Basic analysis based on own’s internship observation</p> <p>Good:</p> <p>Data collection with the help of business mentor interview</p> <p>Excellent:</p>

	<p>petences within the productive activity development.</p> <p>1.1.5. To identify market features, types of clients and suppliers. Influence on the business development.</p> <p>1.1.6. To identify common marketing channels.</p> <p>1.1.7. To identify advantages and disadvantages of the structure of the company relating to other kinds of business organizations.</p>	<p>To complete the analysis with business documents without further help</p>
<p>To make use of work and ethic habits, developing the student's professional activity, according to the characteristics of the workplace and the procedures established by the company.</p>	<p>2.1. Topic. Work and ethical habits</p> <p><i>Tasks:</i></p> <p>2.1.1. To develop habits: personal attitudes (punctuality, empathy, etc.).</p> <p>2.1.2. To have Individual attitudes (order, cleanliness, security necessary for the job, responsibility, among others).</p> <p>2.1.3. To apply attitudinal requirements towards risk prevention in the professional activity and personal protection measures.</p> <p>2.1.4. To develop attitude requirements related to quality in the professional activity.</p> <p>2.1.5. To develop attitudes related to teamwork and to the hierarchy established in the company.</p> <p>2.1.6. To develop attitudes related to the documentation of activities carried out in the workplace.</p> <p>2.1.7. To develop environmental respect according to internal and external standards related to the company.</p> <p>2.1.8. To develop communication and effective relationship with the members of a team.</p> <p>2.1.9. To apply rules and procedures in the development of work activity.</p>	<p>Satisfactory:</p> <p>The student shows enough Individual attitudes regarding the work and ethical habits</p> <p>Good:</p> <p>The student shows genuine interest for the work and ethical habits. The student shows an effort.</p> <p>Excellent:</p> <p>The student is proactive.</p>
<p>To set-up computer equipment following settled system quality procedures.</p>	<p>3.1. Topic. Computer equipment set-up:</p> <p><i>Tasks:</i></p> <p>3.1.1. To analyze technical documentation.</p>	<p>Satisfactory:</p> <p>The student needs trainer support to complete the</p>

	<p>3.1.2. To determine elements and peripherals.</p> <p>3.1.3. To install base software.</p> <p>3.1.4. To install and verificate the operation of peripherals.</p> <p>3.1.5. To operate with equipment and tools according to quality criteria.</p> <p>3.1.6. To work in group.</p>	<p>tasks.</p> <p>Good: The student needs only partial trainer support to complete the tasks.</p> <p>Excellent: The student completes the tasks on his own without further help.</p>
<p>To be involved in faults diagnosis and troubleshooting applying service techniques.</p>	<p>4.1. Topic. Diagnosis and reparation</p> <p><i>Tasks:</i></p> <p>4.1.1. To develope a procedure plan for troubleshooting.</p> <p>4.1.2. To determine breakdown symptoms.</p> <p>4.1.3. To assembly and remove parts.</p> <p>4.1.4. To work with tools.</p> <p>4.1.5. To fill troubleshooting documentation.</p>	<p>Satisfactory: The student needs trainer support to complete the tasks.</p> <p>Good: The student needs only partial trainer support to complete the tasks.</p> <p>Excellent: The student completes the tasks on his own without further help.</p>
<p>Operating systems and applications set-up observing the work plan and customer needs.</p>	<p>5.1. Topic. Operating systems and applications set-up</p> <p><i>Tasks:</i></p> <p>5.1.1. To perform operating systems installation.</p> <p>5.1.2. To configure operating systems according to the requirements.</p> <p>5.1.3. To install and set-up applications.</p> <p>5.1.4. To test equipment.</p> <p>5.1.5. To study install documentation according to business procedures.</p> <p>5.1.6. To restore data using the settled safety standards set.</p>	<p>Satisfactory: The student needs trainer support to complete the tasks.</p> <p>Good: The student needs only partial trainer support to complete the tasks.</p> <p>Excellent: The student completes the tasks on his own without further help.</p>

<p>To get involved in the set-up and maintenance of small communication networks, documenting the work.</p>	<p>6.1. Topic. LAN and internet access set-up</p> <p><i>Tasks:</i></p> <p>6.1.1. To study technical documentation of hardware and software.</p> <p>6.1.2. To install subsystems.</p> <p>6.1.3. To do the cabling.</p> <p>6.1.4. To test wires.</p> <p>6.1.5. To survey the network.</p> <p>6.1.6. To set-up drivers.</p> <p>6.1.7. To set-up communication adapters.</p> <p>6.1.8. To determine basic security parameters.</p> <p>6.1.9. To develop a service and maintenance manual.</p>	<p>Satisfactory:</p> <p>The student needs trainer support to complete the tasks.</p> <p>Good:</p> <p>The student needs only partial trainer support to complete the tasks.</p> <p>Excellent:</p> <p>The student completes the tasks on his own without further help.</p>
<p>To help the user, solving IT workplace problems, according to the company standards.</p>	<p>7.1. Topic. User assistance</p> <p><i>Tasks:</i></p> <p>7.1.1. To identify user needs.</p> <p>7.1.2. To show communication skills with the user.</p> <p>7.1.3. To do backup copies.</p> <p>7.1.4. To track incidents.</p> <p>7.1.5. To advise applications and equipment to users.</p>	<p>Satisfactory:</p> <p>The student needs trainer support to complete the tasks.</p> <p>Good:</p> <p>The student needs only partial trainer support to complete the tasks.</p> <p>Excellent:</p> <p>The student completes the tasks on his own without further help.</p>
<p>To get involved in content management and distance learning systems (among others) set-up, configuration and maintenance among others, following a settled work plan.</p> <p>-</p>	<p>8.1. Topic. Content managers and distance learning platforms</p> <p><i>Tasks:</i></p> <p>8.1.1. To analyse requirements.</p> <p>8.1.2. To do security backups.</p> <p>8.1.3. To develop a work plan according to the settled quality standards.</p> <p>8.1.4. To do the selection, installation and configuration of contents management tools.</p>	<p>Satisfactory:</p> <p>The student needs trainer support to complete the tasks.</p> <p>Good:</p> <p>The student needs only partial trainer support to complete the tasks.</p>

	<p>8.1.5. To do the selection, installation and configuration of distance learning platforms.</p> <p>8.1.6. To do systems maintenance.</p> <p>8.1.7. To develop documentation and work plan results.</p> <p>8.1.8. To determine information access security criteria.</p> <p>8.1.9. To perform functional testing.</p> <p>8.1.10. To documentate changes.</p> <p>8.1.11. To design user reports.</p>	<p>Excellent:</p> <p>The student completes the tasks on his own without further help.</p>
<p>To be able to do simple developments and know the whole software life cycle</p>	<p>9.1 Topic. Classical and web programming. Databases.</p> <p><i>Tasks:</i></p> <p>9.1.1. To do simple script programs.</p> <p>9.1.2. To do simple developments with a classical programming language.</p> <p>9.1.3. To be ware of the software engineering life cycle.</p> <p>9.1.4. To perform simple analysis, design, code and testing tasks.</p> <p>9.1.5. To design simple databases.</p> <p>9.1.6. To fill simple databases.</p> <p>9.1.6. To query simple databases.</p> <p>9.1.7. To obtain simple databases reports.</p>	<p>Satisfactory:</p> <p>The student needs trainer support to complete the tasks.</p> <p>Good:</p> <p>The student needs only partial trainer support to complete the tasks.</p> <p>Excellent:</p> <p>The student completes the tasks on his own without further help.</p>
<p>Recommended learning methods</p>	<p>The student makes a professional internship in a real workplace. Prior to the internship the college develops an individual training program together with the business according to its profile.</p> <p>The student is assigned a trainer at the business and a teacher at the college. The teacher overlooks the whole work and should be in contact with the trainer. The student should always report the trainer and he should assign him tasks according to the program.</p> <p>The trainer should report his evaluation to the teacher.</p> <p>The student should fill a diary with the tasks he is developing.</p>	

Material resources	Learning material: real business manuals and documents used at classroom in previous modules.
	Learning supplies: <ul style="list-style-type: none"> - A copy of the training program. - Information about the business location, work time and trainer. - Teacher contact.
	Other resources:
Teachers' qualification	Higher education diploma in ICT and completed authorised course in pedagogy and psychology.
Module organizers	Susana Valero, Vicente Tatay, Merche Arráez, Manuel M ^a Villapecelin