Institution: **TECHNICAL UNIVERSITY OF MOLDOVA** (TUM)

Course Description

Module Handbook

TITLE OF COURSE: Visualization (How to Make Efficient Visual Aid)

Course description

Overview	
Aims and Learning Outcomes	The aim of the course is to train high-quality teaching staff from vocational education institutions that will be able to produce illustrative didactic materials. The course aims to develop skills to promote high-quality visual teaching materials through the use of digital tools and dedicated software. At the end of the course, trainers/ teachers should be able to create efficient visual learning resources, that draw the attention of the trainees, facilitate the understanding and direct discussions to lesson themes. At the end of the course participants should have: **Theoretical understanding** • Understanding of the importance of visual materials in teaching and learning process. • Understanding of the advantages and disadvantages of using the ICT technologies for design teaching contents • Understanding the role of colors in the illustrative materials and the principles of their selection **Practical experience** • Analyzing the training content to decide the format of the visualization materials; • Producing effective visual materials with dedicated ICT tools and software; • Visualizing data, concepts, procedures, processes and principles specific to own course; • Evaluating visual messages from the point of view of correlation with purpose, environment, format, balance, style, abstraction level, harmony of colors and effectiveness; • Developed active learning activities using ICT. **Opportunity for reflection** • Reflected in their existing course (redesign course)) • Reflected in their language (use the specific terms in this environment) • Reflected in their critical thinking on the quality of teaching materials and visualization techniques
Target Audience & Requirements	The course is relevant to all teachers, school leaders and other stakeholders who are interested in the topic of making efficient visual aid. Thus, the course is mainly addressed to the teaching staff that ensure the teaching-learning act for the VET sector. Unfortunately, the staff involved in teaching does not have the psycho-pedagogical grounding that is imperative for the teaching-learning act,

Overview	
	as well as practical abilities to produce visual materials and digital resources. **Requirements for target audience** Knowledge: *theories of learning, didactic projection, strategies and methods of training and evaluation.* Abilities: *digital competences (using generic applications, searching information on the Internet, developing electronic presentations, using the electronic portfolio).*
Duration and estimated workload of course	The course consists of 4 modules of a total workload of 90 hours: 2 modules for face to face/class learning with a total duration of 48 hours; 2 modules for individual learning with a total duration of 42 hours; one day is dedicated to coaching. Some of the course activities are dedicated to self-learning with the use of Moodle platform and other activities will take place in the training rooms of the Centre of Continuous Formation at TUM. At the end of the course unit a couching session will be provided by the trainees. Number of ECTS awarded: 2,5 ECTS
Assessment and Certification	The assessment system is based on the belief that knowledge, skills and attitudes are all important. Thus, when establishing the final note, consideration shall be given to:

Knowledge (at the end of the 1st module)   **100 points**
    Test (mix of a simple multiple choice quiz)

Professional skills   **250 points**
    Portfolio with tasks:
      - Title sheet/Logo (CorelDRAW)   50
      - Skill card (Office World)   50
      - Course introduction (SMART Notebook)   50
      - Process (CorelDRAW, Corel PHOTO-PAINT)   50
      - Concept (iMindMap)   50

Transversal skills   **100 points**
    Communication

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Contribution to the training effort in general Participating in Group Work Demonstration of leadership capacity
TOTAL   **450 points**
Only the trainees that will accumulate more than 325 points will be certified. The trainees who for some reasons did not get any performance may repeat the course.
At the end of the course the trainees will be given certificates issued by the Ministry of Education, Culture and Research and registered at the Public Services Agency.

Modules' description

MODULE 1	Description
Module title:	***Why visualise?***
Learning objectives of module:	- To understand why the visual materials are so important in the teaching-learning process. - To understand the principles of the visual perception in order to build efficient visual materials. - To select the adequate level of abstraction for the didactic message correlated with the learning objectives. - To understand the importance of the colors used in the design of the illustrative materials. - To identify different types of visual didactic materials and the specific of their use.
Content to be covered	• **Why visualise?**: argues the usefulness of visual materials, text and sound in didactic activity. • **Visual perception**: explains the principles of visual perception that will be needed to design effective visual materials. • **Levels of the visual perception**: is how one concept (e.g. phone, car) can be viewed through different levels of abstraction. • **Colors – basic notions**: indicates the use of color harmony and contrast. • **Chromatic circle**: will be used the chromatic circle and templates in order to select different color schemes according to color theory. • **Research concerning the visual didactic materials**: will be presented

MODULE 1	Description
	some findings from selected scientific researches with reference to visual teaching materials.
Teaching and learning activities	This module is largely envisaged for independent work. However, several activities are proposed: • The teacher will provide students with a set of 5 images found on the Internet, in which the same subject (eg the vehicle braking system) is represented. Students will have to analyze them, through their primary knowledge, and choose the image that mostly describes the subject. The decision must be justified by identifying the advantages and disadvantages of each image. Discussions will take place on a forum created specifically on the Moodle platform. • Each trainee should present a concept (car, smartphone, laptop etc) through different levels of abstraction. The task file (Office Word or PowerPoint) will be sent to the trainer for evaluation. • According to a video resource available on YouTube, students will create a chromatic circle with traditional utensils available (pencils, watercolor, etc.). The final result will be scanned or photographed and will be placed on the forum created to initiate a discussion on the role of colors in teaching.
Assessment	Each theoretical content will be completed with a simple formative test (dual choice) and at the end of the module the trainees will undergo a general knowledge test (multiple choice). Students will repeat this final test until they will accumulate the minimum required score for promotion. Active learners in the forum debates will be further graded by the teacher. Terms of use of the forum for pre-announced in the instructions sent to each learner by email. In an electronic progress record sheet created for each individual trainee, the trainer will introduce the score obtained by the trainees.

MODULE 2	Description
Module title:	*Basic skills training*
Learning objectives of module:	- To make a difference between the format fo digital images that are frequently used in the creation of the digital didactic contents. - To fiind in reasonable time qualitative digital images form the Internet, in order to create digital didactic content taking into account the format, the resolution and the type of the images. - To be able to use the basic tools offered by the raster graphic redactor Corel PHOTO-PAINT (Object Pick Tool, Mask Tool, Crop Tool, Clone Tool etc.), in order to process raster digital images. - To be able to use the basic tools offered by the vectorial graphic redactor CorelDRAW (Pick Tool, Shape Tool, Drow Curves Tool, Rectangle or Elipse Tool, Text Tool etc.), in order to create vectorial digital images. - To produce a simple visionary map in digital format assisted by the software MindMap.
Content to be covered	• **Beginning in vector and raster graphics**: discussions on the ways of presenting visual materials. To prove the difference between raster graphics and vector graphics. Based on examples of images, the opportunities and limits for the two types of graphics are achieved. • **Using CorelDRAW for redesigning teaching material**: will be presented the CorelDraw vector graphics editor interface and drawing tools. The graphics editor's opportunities will be shown. • **Using Corel PHOTO-PAINT for improving open source image**: The Corel PHOTO-PAINT raster graphics interface and drawing tools will be presented as well as the graphics editor's opportunities. • **iMindMap – Overview. Designing a conceptual map**: the usefulness of conceptual maps in the didactic process is demonstrated. The iMindMap software and its possibilities are presented.
Teaching and learning activities	• The trainer will provide trainees with paper-based course support, which includes more images, and trainees will need to identify the best images in terms of quality. They will have to explain the phenomenon of appearance of different quality images in didactic content. The trainees, through their primary knowledge, can offer

MODULE 2	Description
	ways to improve the quality of the images used to create the didactic content.
	• Trainees, based on criteria provided by the trainer, will need to find and select a single image on the internet that reflects a particular process. After analyzing the images found by the learners, an algorithm will be proposed that will facilitate the search of digital images on the internet.
	• The trainer will make a general presentation of the CorelDRAW vector graphics editor, and then will focus in detail on the tools commonly used for vector image creation. Simultaneously, the trainees will access the CorelDRAW software by discovering the features of using vector vectoring tools.
	• Under the guidance of the trainer, traineess will need to reproduce a simple raster image downloaded from the Internet in vector format, and at the end of the activity to make the difference between these two images. A discussion will be launched on the need for graphic designers for trainers.
	• The whole process of capturing the vector image is recorded using the Camtasia Recorder software, which can then be accessed from the Moodle platform.
	• The trainer will make a general presentation of the Corel PHOTO-PAINT raster graphics editor, and then will focus on the tools commonly used for drawing raster images. Along with the trainer, trainees will access the Corel PHOTO-PAINT software discovering in a row the particularities of using raster image editing tools.
	• Under the trainer's guidance, trainees will need to draw a black-and-white raster image downloaded from the Internet by removing irrelevant elements, adding color, adding notions that will facilitate understanding of the teaching message, etc. At the end of the activity, a discussion will be started on the opportunities and limits of a raster image editor. All the raster image editing process is recorded using the Camtasia Recorder application, which can then be accessed from the Moodle platform.
	• The trainer will initiate a discussion on the use of concept maps in didactic activity by identifying the benefits and limits of their use. Next, together with the trainees, a concept map will be created by the traditional method, and towards the end of this activity, the trainer will present the same concept map made using the iMindMap software.

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	• The trainer will make a brief overview of the iMindMap software, then will focus on the steps and tools needed to build a concept map. Along with the trainer, trainees will access the iMindMap software by discovering in turn the particularities of using the tools to create a digital quality product. • Under the guidance of the trainer, each trainee will have to make a concept map with at least 4 basic branches using the iMindMap software.
Assessment	The trainer will assess the involvement of the trainees in their activities, and at the end of each training day, in a performance criteria form, they will evaluate the products obtained in the practical activities and the attitude they have shown during their realization. The score obtained by the trainees will be filled into the Pro-grease record sheet.

MODULE 3	Description
Module title:	*Improving skills*
Learning objectives of module:	- To identify valuable didactic materials that must be adjusted or changed due to gained knowledge and to the abilities formed. - To decide about digital tools suitable to create or to modify the digital didactic content. - To accomplish individually digital didactic contents using the graphic redactor CorelDRAW, the PowerPoint software or iMindMap.
Content to be covered	• **Visualisation of the concepts**: Creating and testing a visual didactic support that teaches a concept. For this product, the iMindMap software will be used extensively. • **Visualisation of the processes/principles**: Creating and testing a visual didactic support through which a process or principle is handed over. This product will be fully integrated with the CorelDRAW / Corel PHOTO-PAINT graphic editor. • **Skill card preparation**: Creating and testing a visual didactic support through which a procedure is handed over. This product will be accomplished in the Office Word text editor, which will include at least 5 images processed in the CorelDRAW / Corel PHOTO-PAINT graphics editor.

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MODULE 3	Description
Teaching and learning activities	This module is fully envisaged for self-learning. However, trainees are encouraged to use the forum on the Moodle platform, where they can ask questions to the trainer or help each other with advice to find solutions to certain problem situations. The trainer will establish a plan according to which the trainees will have to submit the products for evaluation in time. This time bounding will sensitize learners to work systematically on individual tasks and will allow the framework to provide all feed-back in a timely manner.
Assessment	Trainers will allocate marks/points for each product, and those who will exceed the product submission deadline will be fined for the attitude. The trainees actively involved, providing useful tips to their colleagues on the forum, will be given additional points. The score obtained by the trainees will be filled into the progress record sheet.

MODULE 4	Description
Module title:	*Visual thinking*
Learning objectives of module:	- To choose computer fonts / faces that correspond to the created didactic message. - To elaborate a design that facilitates the transmission of the didactic message (work surface layout, visibility and legibility of images and text, chromaticity of colors, etc.). - To understand the impact of using the IWB in the teaching process, the limitations of this instrument and the need to develop personal digital skills. - To understand basic practical skills for working with an IWB (connection-disconnection, file handling, Internet browsing, etc.). - To evaluate with high degree of objectivity a visual didactic content, based on well-defined criteria of appreciation.
Content to be covered	• **Using characters for effective visual teaching content**: there are proposed a series of recommendations on the use of computer fonts / faces.

MODULE 4	Description
	• **Arrangement of visual didactic content:** for all tasks, an effective and adequate arrangement of the visual didactic content is demonstrated. • **How to Use the IWB: Teaching Approaches**: a demonstrative activity with IWB is presented which shows the opportunities for using it. The SMART Notebook software is presented. • **Form of assessment of the visual didactic content:** evaluation of a visual didactic content in digital format from the perspective of its objective, using the specially developed criteria.
Teaching and learning activities	• In small groups, the CorelDRAW graphics editor will create a very simple design card. Discussions on the result obtained will be focused on the choice of computer fonts for the realization of visual teaching content in digital format. • Students will make a poster (eg in the field of labor security) based on digital images provided by the teacher. The design of the poster will be based on recommendations made by the teacher. The analysis of the final result will allow the formulation of general criteria for the design of a design for visual teaching content. • After presenting the opportunities offered by IWB, a group activity will be initiated, which will have the following objectives: - identify the sequences or parts of a traditional lesson that can be transferred to the IWB; - identify the right moments for using the IWB in a lesson; - how IWB will be used – in the training room, in the laboratory, individually, in the group? • Each trainee will present to IWB an introduction to the lecture (max. 5min.), elaborated with the assistance of the software SMART Notebook. At the end of each presentation, colleagues will provide feedback to the presenter. • The teacher will organize an exhibition of student portfolios made during this course, where each learner will be able to evaluate, on the basis of performance criteria, the products made by colleagues. At the end of the exhibition, totals will be made to identify winning products.
Assessment	The trainer will assess the trainees' involvement in the activities and at the end of each training day will give score for the products obtained in the practical activities and the attitude they have shown during their realization, according to their key performance indicators laid down in a template.

MODULE 4	Description
	The score obtained by the trainees will be filled into the progress record sheet.