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Modernization of Pedagogical Higher Education
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CONCEPT COURSE ¹

HIGHER EDUCATION INSTITUTION		Luhansk Taras Shevchenko National University
Institute (faculty), department or other structural unit conducting the course		Institute of Physics, Mathematics and Information Technologies of Luhansk Taras Shevchenko National University, Department of Information Technologies and Systems
DESCRIPTION OF THE EDUCATIONAL DISCIPLINE		
1	Course name	Methodology of Using Digital Technologies in School Education.
2	Module code	[15mps6].(ED2.5)
3	Cycle/level of higher education	Ukraine NQF – 6th level, FQ-EHEA – 1st cycle, EQF-LLL – 6th level First (Bachelor's) level
4	Degree	Bachelor
5	Branch of knowledge	01 «Education», 014 «Secondary education»
6	Specialty, specialization (if any)	014.04 Secondary education (Mathematics)
7	Name of the educational program, which includes the course	014.04 Mathematics. Physics. The first educational level
8	Educational qualification	Bachelor of secondary education (subject subjects "Mathematics", "Physics"), teacher of mathematics and physics
9	Characteristic of the course by the form	Full-time, part-time (using digital learning technologies)

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	of study	
10	Status of the course	Compulsory (014.04 Mathematics. Physics), elective (for other specialties)
11	Prerequisites for the course	List of disciplines that should be studied before: Pedagogy, Didactics, General Psychology, Age Psychology, Methodics of Teaching Informatics, School Course of Informatics, Basic knowledge and skills in digital literacy
12	Year of study, semester	3th year, 5th semester
13	The volume of the course in ECTS credits and its distribution in hours by the forms of organization of educational process and types of classes	3,0 ECTS credits. Total hours: 90, incl. full-time form of study: 18 lecture hours, 42 hours for practical and laboratory classes, 30 hours – consultations, individual student work.
14	Form of the final evaluation	test
15	Study language	English
16	Internet address of the permanent placement of course educational content	Ошибка! Недопустимый объект гиперссылки. http://do.luguniv.edu.ua/course/view.php?id=28213
17	Developer(s), working group (members)	Hennadii Mohylnyi, Mykola Semenov, Volodymyr Matiiievskyi
Brief summary of the course		
<p>The course "Use of Digital Technologies for Supporting Learning and Teaching at School" provides conditions for preparing future teachers to use digital learning technologies at school and creates opportunities for pedagogical creativity. A feature of the course is the practical orientation, the creation of educational content, the use of a business game for modeling pedagogical situations and evaluation of the developed methodology.</p> <p>The content of the training course contains materials from several main topics: methodology of developing e-learning content; methodology of using digital instruments during educational process at school; organization of digital and blended learning; work with computer e-learning platforms; organization of communication and cooperation in the e-learning environments, connectivity in educational technologies; modern services for organizing digital educational environment in school; methods and technologies for evaluating e-learning tools; teacher's tools to ensure the quality of e-learning - Moodle, Google, Microsoft and others.</p>		
Key concepts:		



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Digital competence, digital literacy, digital pedagogical technologies, digital teaching tools, connectivity, digital learning, blended learning, distance learning, LMS	
Course Objective:	
The course is intended for future teachers to form their professional and pedagogical digital competences; to prepare students for implementation of modern pedagogical technologies and ensuring the quality of digital learning in secondary education institutions.	
Program competencies formed during the course	
Integral competency (IC)	Ability to create and implement pedagogical technologies at school that are based on the use of digital instruments.
General competencies (GC)	GC-6 Digital competency. (Ability to use digital technologies in various fields of activity.) GC-7 Cognitive flexibility. Ability to acquire new knowledge.
Professional (special) competencies (PC)	PC-3 Ability to organize learning and teaching process with use of digital technologies. PC-6 Ability of integrated application of pedagogical technologies and digital instruments. PC-7 Ability to use digital technologies for evaluation of students' learning outcomes.
Intended learning outcomes	
Intended learning outcomes	Forms and methods of assessment
LO 1.1. Know the essence of digital technologies, the genesis of this concept, its differences from information and communication technologies.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
LO 1.2. Realize the theoretical reasoning of the planning and organization of the educational process with the use of digital technologies.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
LO 1.3. Understand the transdisciplinarity of digital technologies and their significance for STEAM.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
LO 2.1. Create educational digital content.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study,



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	test
LO 2.2. Gain the skills of using digital instruments in the educational process.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
LO 3.1. Evaluate students' digital educational achievements.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
LO 3.2. Create educational and methodological support for digital education at school.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
LO 3.3. Prepare and conduct a STEAM project.	self-assessment, peer assessment, expert assessment, tests laboratory, research work, design work, case-study, test
Control of students' academic progress	
Criteria for evaluating learning outcomes	<p>Evaluation criteria:</p> <ul style="list-style-type: none"> level of awareness of the concept of digital technologies and their impact on education; awareness of the main regulatory documents and standards on digital competence of teachers; ability to formulate ways of possible use of digital technologies for the organization of educational process at school; ability to compare European and Ukrainian regulatory documents; knowledge of the theoretical basis of digital learning, the ability to explore its characteristics. <p>Levels: high, medium, sufficient.</p> <p>High level:</p> <ul style="list-style-type: none"> the applicant has a high level of awareness of the concept of digital technologies in education; knows the basic regulatory documents and standards regarding digital competence; knows the means of possible use of digital technologies for the organization of the educational process; is able to compare European and Ukrainian regulatory documents; shows high knowledge of the theoretical basis of digital learning. <p>Average:</p> <ul style="list-style-type: none"> the applicant has an average level of awareness of the concept of digital technologies in education; knows the basic regulatory documents and standards regarding digital competence; focuses on the means of possible use of digital technologies for the organization of the educational process;



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	<p>is able to compare European and Ukrainian regulatory documents; shows average knowledge of the theoretical basis of digital learning. Sufficient level: the applicant has a sufficient level of awareness of the concept of digital technologies in education; is aware of the existence of basic regulatory documents and standards regarding digital competence; knows the means of possible use of digital technologies for the organization of the educational process; shows fragmentary knowledge of the theoretical basis of digital learning.</p>
Learning outcomes diagnostic tools (current and final assessment)	<p>Self-assessment Peer assessment Expert evaluation Test module work (written work or computer test) defense of laboratory work defense of research, design work Test</p>
List of questions for final control	<p>The accumulative system of estimation is used, subjects for control modular works coincide with themes of academic discipline.</p>
Summative assessment and feedback.	<p>100 points for the course A 1.1 – 2% A 1.2 – 2% P 1.1 – 5% P 1.2 – 5% A 1.3 – 3% A 1.4 – 3% P 1.3 – 5% P 1.4 – 5% CMW 1 – 15% P 2.1 – 2% L 2.1 – 2% L 2.2 – 2% L 2.3 – 2%</p>



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	<p>P 2.2 – 3%</p> <p>P 2.3 – 3%</p> <p>L 2.4 – 2%</p> <p>P 2.4 – 3%</p> <p>L 2.5 – 3%</p> <p>P 2.5 – 3%</p> <p>L 2.6 – 3%</p> <p>P 2.6 – 2%</p> <p>L 2.7 – 3%</p> <p>P 2.7 – 2%</p> <p>L 2.8 – 3%</p> <p>P 2.8 – 2%</p> <p>L 2.9 – 3%</p> <p>CMW 2 – 15%</p> <p>Information about the results of evaluation is available to students on the site with the course content. The grades have teacher's reviews with remarks and instructions.</p> <p>Each task has a time limit for its completion.</p> <p>The teacher conducts an evaluation of the tasks completed.</p> <p>Defense and correction of the grade is done during consultations and f2f sessions.</p> <p>Project work is evaluated during open defense: presentation and answers to questions.</p> <p>Consultations are planned in the weekly schedule of the course, implemented both virtually and f2f.</p> <p>Teacher's contacts are present in the course as an e-mail address.</p> <p>During the final assessment the following HEI grading scale is used.</p>
Grading scale	



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	AMOUNT OF POINTS	ECTS Grade	GRADE ACCORDING TO NATIONAL SCALE	
			exam	test
	90-100	A	excellent	pass
	83-89	B	good	
	75-82	C	satisfactory	
	63-74	D		
	50-62	E	fail	fail (possibility of retak
	21-49	FX		fail (no possibility of reta
	0-20	F		

The structure of the discipline

Names of content modules and topics	Number of hours											
	full-time form						part-time form					
	total	including					total	including				
		1	p	lab	ind	self.		1	p	lab	ind	self.
1	2	3	4	5	6	7	8	9	10	11	12	13
Module 1												
General methodology of using digital technologies in educational process												
Topic 1.1 Theoretical rationale of digital learning The philosophy of digital technologies and their place in higher education: opportunities and risks. European and Ukrainian regulatory documents, standards about digital	16	8	2			6	16	2				14



competence of the teacher. Digital learning: theoretical substantiation, principles of digital learning and different approaches to its organization.												
Topic 1.2. Methodology of digital learning organization Technology of creating digital content. Methods of supporting students in digital learning. use of digital tools. Methodology of evaluating students' learning achievements in digital learning. Digital technologies in STEAM education.	28	10	6			12	28	4	2			22
Total for module 1	44	18	8	0		18	44	6	2	0	0	36
Module 2												
Application of digital technologies in educational process												
Topic 2.1 Basics of pedagogical design of a digital course Ensuring the quality of digital learning. Digital content planning (distance course). LMS Basics.	12		2	6		4	12					12
Topic 2.2 Development of the digital course in a team Curriculum design for the team course. Presentation of theoretical material in the digital course. Organization of practical activities in the team course	18		8	6		4	18		2			16
Topic 2.3 Support of the digital course Organization of student support for digital learning. Course improvement. Organization	16		6	6		4	16			2		14



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of evaluation of learning outcomes.												
Total for module 2	46	0	16	18		12	46	0	2	2	0	42
Total hours	90	18	24	18		30	90	6	4	2	0	78

Course Program (content block)

Topic	Topics of seminars / practical / laboratory classes (if any)	Approximate topics for individual and / or group tasks (if any)	Tasks for individual work
Module 1	General methodology of using digital technologies in educational process		
Topic 1.1. Theoretical rationale of digital learning	P 1.1. Development of recommendations for organization of digital learning at school	A 1.1. Discussion “What is digital technology in education?” A 1.2. Making a summarizing report “Digital literacy” (group work)	Search for additional information on the topic on the Internet. Search and analyze information about the definition of the term “digital technologies”. Critically analyze the proposed paradigms of digital education, suggest your own solutions Do additional independent studying and processing of documents Create additional summaries of answers to the questions. Familiarize with the SELFIE system.
Topic 1.2 Methodology of digital learning organization	P 1.2 Development of pedagogical scenario of digital content P 1.3 Design of rubrics for criteria. Design of computer test scenario. P 1.4 Developing a STEAM lesson scenario.	A 1.3. Group discussion “Organization of support in digital learning” A 1.4. Group discussion “Digital tools in course development”	Look for the information in the sources. Create summaries of answers to the questions. Explore the following digital tools: tools for creating a website or blog; tools for shortening hyperlinks; tools for creating scribing; tools for creating educational materials; QR codes; survey and testing



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			tools, etc. Read Scientix (a european community for science and mathematics teachers) and European Schoolnet
Module 2	Application of digital technologies in educational process		
Topic 2.1 Basics of pedagogical design of a digital course	P 2.1 Development of requirements for digital learning. L 2.1 Setting up the course L 2.2 Creating course prototype L.2.3 Adding elements to the course		Preparation for the classes. Pay attention to the system of quality assurance of educational activities and quality of higher education system of internal and external quality assurance. Consider which of the systems can be used at school. Pay attention to the differences in planning when digital technologies are used in the learning process (compared to the standard approach). Focus on Moodle and compare it to other LMSs.
Topic 2.2 Development of the digital course in a team	P 2.2 Creating the syllabus for the team course L 2.4 Presentation of planning in the course. P 2.3-2.4 Designing theoretical material for the course L 2.5 Presentation of learning content in the course. P 2.5 Development of scenarios of practical classes for the course L 2.6 Implementation of practical classes in the course		Preparation for the classes. Pay attention to LMS Moodle and the main elements for the presentation of theoretical material in it.
Topic 2.3 Support of a digital course	P 2.6 Development of scenarios for consultations, chats and other communication features		Preparation for the classes. Pay attention to search for information about new tools for questioning and testing. Compare them with well-known tools



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	<p>L 2.7 Creating support components in the course P 2.7 Considering the methods of improving the course L 2.8 Improving course content P 2.8 Development of evaluation criteria L 2.9 Methods of assessment in the course</p>		
Technological and resource support used for a course (as needed))			
Use of opportunities of the innovation class as a component of the educational ecosystem MoPED	A class of creative training is used.		
Recommended sources of information (including electronic resources)	<p>Main</p> <ol style="list-style-type: none"> 1. DigComp 2.0, URL: https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework 2. DigComp 2.1 URL: https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digcomp-21-digital-competence-framework-citizens-eight-proficiency-levels-and-examples-use 3. European commission. Proposal for a Council Recommendation on Key Competences for Lifelong Learning. Brussels, 17.1.2018. URL: https://ec.europa.eu/education/sites/education/files/recommendation-key-competences-lifelong-learning.pdf 4. Кухаренко, В. М., О. В. Рибалко, and Н. Г. Сиротенко. "Дистанційне навчання: Умови застосування. Дистанційний курс: Навчальний посібник." Харків: НТУ" ХП", " Торсінг (2002). 5. Структура ІКТ-компетентності учителів. Рекомендації ЮНЕСКО, CFT (2008, 2011, 2012) URL: https://iite.unesco.org/ru/publications/struktura-ikt-kompetentnosti-uchitelej-rekomendatsii-unesco/ 6. Цифрова адженда України – 2020. Концептуальні засади (проект). URL: https://uccr.org.ua/uploads/files/58e78ee3c3922.pdf <p>Additional</p>		



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Internal quality assurance system of teaching the course

Conducting student survey about the quality of teaching the course and the results of their success.
Feedback from independent internal and external experts on the quality of teaching the course.