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## DIGITAL SERVICES AND APPLICATIONS IN SCIENTIFIC AND PEDAGOGICAL RESEARCH COURSE SYLLABUS

level of higher education	third (educational and scientific)
branch of knowledge	01 Education / Pedagogy
specialty	011 Educational, pedagogical sciences
educational program	Educational, Pedagogical sciences
type of discipline	on request
a year of training	2
semester	4
the number of credits	5
the total number of hours	150
Full-time education	lectures – 32 hours, practical, seminar classes – 32 hours, independent work 86 hours.
Correspondence (distance) form of education	lectures – 10 hours, practical, seminar classes – 10 hours, independent work – 130 hours.

## INTRODUCTION

The program of the educational discipline "Digital Services and Applications in Scientific and Pedagogical Research" is compiled in accordance with the educational and professional (educational and scientific) training program "Educational and Pedagogical Sciences" of the third (educational and scientific) level, specialty: 011 educational and pedagogical sciences.

### 1. Description of the academic discipline

1.1. The purpose for teaching of the educational discipline : formation of knowledge about the possibilities of using digital services and applications in education and scientific and pedagogical research in PhD students, practical skills to apply this knowledge during scientific research and implementation of the educational process.

1.2. The main objectives of the studying of the discipline:

- to acquaint PhD students with the history of digitalization of education and pedagogical science, as well as prospects for the further development of this process;
- to inform applicants about the normative basis of digitization of education and scientific and pedagogical research;
- to provide future specialists in the field of pedagogy with knowledge about digital transformation in the field of education and science, its characteristic features, common strategic vectors of the USA and EU countries regarding the activation of this process
- determine ways of digitalization of education, positive and negative sides, and risks of this process;
- to form an idea of open science and its inherent characteristics, the policy of the European Commission on ensuring the openness of science, the principles of FAIR on the management of scientific research data in PhD students;
- to form practical skills of the applicants in using digital services and applications in conducting scientific and pedagogical research and publishing their results.

The academic discipline "Digital Services and Applications in Scientific and Pedagogical Research" ensures that students acquire the following competencies:

CC 3 – the ability to generate new ideas in the process of solving professional-pedagogical and research tasks.

CC 5 – the ability to use modern computer, digital and mobile technologies in pedagogical and educational activities.

CC 6 – ability to search, process, critically analyze, interpret and apply information from various sources in scientific and pedagogical activities

PC 5 – the ability to develop, implement and adequately evaluate educational and interdisciplinary projects and programs.

PC 9 – the ability to improve and develop one's own educational methods and technologies, to use a wide arsenal of expediently selected methods and forms of training of students in classes.

1.3. Intended educational outcomes:

PLO 14 – to use the acquired psychological and pedagogical knowledge and skills, experience in design activities in the development and implementation of educational and interdisciplinary projects and programs, to master practical fundraising techniques, skills of registration of intellectual property rights;

PLO 15 – to apply innovative information and communication technologies, specialized software in teaching and research activities, develop didactic materials based on their use;

PLO 21 – to creatively apply the achievements of innovative pedagogy in teaching and research activities, to critically evaluate the pedagogical significance of the proposed educational innovations, to generate their own innovative ideas, to identify topical and pedagogical problems that require urgent solutions;



PLO 23 – to design and evaluate the educational context aimed at training competent teachers and researchers with developed critical and creative thinking and capable of successfully performing their professional duties;

PLO 24 – to manage the educational activities of students based on the implementation of their own educational methodology and author's teaching technologies, ensuring the quality of education through the systematic use of various teaching methods and forms;

PLO 26 – to demonstrate creativity in pedagogical and research activities, generate innovative scientific ideas, propose new non-standard ways to solve problems, demonstrate the ability to formulate and justify the author's concept of research.

## 2 Content of the educational discipline by modules and topics

### *Section 1 Digitalization of pedagogical science and education as an innovative trend*

Topic 1 Legal and conceptual foundations of digitalization of pedagogy and education in Ukraine

Topic 2 History and prospects of digitalization of science and education

Topic 3 Characteristics and prospects of digitalization of education and pedagogical science

### *Section 2 Use of digital services and applications in conducting scientific and pedagogical research and publishing their results*

Topic 4. Digital services as a source of information for scientific and pedagogical research

Topic 5 Application of digital services, applications for organizing and conducting scientific research in the field of pedagogy

Topic 6 Using digital tools to present research results and discuss them with colleagues

## 2. Structure of the academic discipline

Names of contents chapters and topics	Number of hours											
	Full-time study						Part-time study					
	In total	including					In total	including				
		l	p	lab	pers	self-study		l	p	lab	pers	self-study
1	2	3	4	5	6	7	8	9	10	11	12	13
<b><i>Section 1 Digitalization of pedagogical science and education as an innovative trend</i></b>												
Topic 1 Legal and conceptual foundations of digitalization of pedagogy and education in Ukraine	16	4	2			10	18	2				16
Topic 2 History and prospects of digitalization of science and education	16	2	4			10	16		1			15
Topic 3 Characteristics and prospects of digitalization of education and pedagogical science	18	4	4			10	16		1			15
<b>Total for section 1</b>	<b>50</b>	<b>10</b>	<b>10</b>			<b>30</b>	<b>50</b>	<b>2</b>	<b>2</b>	<b>2</b>		<b>46</b>

<i>Section 2 Use of digital services and applications in conducting scientific and pedagogical research and publishing their results</i>												
Topic 4 Digital services as a source of information for scientific and pedagogical research	34	8	8			18	31	2	2			28
Topic 5 Application of digital services, applications for organizing and conducting scientific research in the field of pedagogy	34	8	8			18	36	4	4			28
Topic 6 Using digital tools to present research results and discuss them with colleagues	32	6	6			20	32	2	2			28
<b>Total for section 2</b>	<b>100</b>	<b>22</b>	<b>22</b>			<b>56</b>	<b>100</b>	<b>8</b>	<b>8</b>			<b>84</b>
<b>In total</b>	<b>150</b>	<b>32</b>	<b>32</b>			<b>86</b>	<b>150</b>	<b>10</b>	<b>10</b>			<b>130</b>

#### 4. Topics of seminar (practical, laboratory) classes

No.	Name of topic	Number of hours
<i>Section 1</i>		
<i>Digitalization of pedagogical science and education as an innovative trend</i>		
1	Topic 1 Legal and conceptual foundations of digitalization of pedagogy and education in Ukraine	2
2	Topic 2 History and prospects of digitalization of science and education	4
3	Topic 3 Characteristics and prospects of digitalization of education and pedagogical science	4
	<b>Together by section 1</b>	<b>10</b>
<i>Section 2 Use of digital services and applications in conducting scientific and pedagogical research and publishing their results</i>		
4	Topic 4 Digital services as a source of information for scientific and pedagogical research	8
5	Topic 5 Application of digital services, applications for organizing and conducting scientific research in the field of pedagogy	8
6	Topic 6 Using digital tools to present research results and discuss them with colleagues	6
	<b>Together by section 2</b>	<b>22</b>
	<b>In total</b>	<b>32</b>



## 5. Tasks for self-study

No.	Name of topic / chapter	Form of work	Number of hours
<i>Section 1 Digitalization of pedagogical science and education as an innovative trend</i>			
1	Topic 1 Legal and conceptual foundations of digitalization of pedagogy and education in Ukraine	Processing of national and foreign regulatory documents, preparation of a report with a multimedia presentation	10
2	Topic 2 History and prospects of digitalization of science and education	Creation of a script for a discussion panel on the topic "My predictions regarding the further digitalization of science and education"	10
3	Topic 3 Characteristics and prospects of digitalization of education and pedagogical science	Elaboration of the proposed sources, preparing a table with the definition of the characteristics of digitalization of education and pedagogical science	10
<b>Together by section 1</b>			<b>30</b>
<i>Section 2 Use of digital services and applications in conducting scientific and pedagogical research and publishing their results</i>			
4	Topic 4. Digital services as a source of information for scientific and pedagogical research	Analysis of scientific literature, infographics	18
5	Topic 5 Application of digital services, applications for organizing and conducting scientific research in the field of pedagogy	Preparation of a mini-report with a presentation, preparation and conducting of a master class	18
6	Topic 6. Using digital tools to present research results and discuss them with colleagues	Preparation of a presentation and poster report on the topic of the dissertation research	20
<b>Together by section 2</b>			<b>56</b>
<b>In total</b>			<b>86</b>

## 6. Individual tasks

## 7. Teaching methods

Lectures, roundtables, discussion panel, webinars, multimedia presentations, performance of practical tasks and exercises, infographics, work with educational and scientific literature, self-study with use of digital services and applications.

## 8. Control methods

Oral survey; checking of written exercises and tasks; preparation and work at seminar classes; multimedia presentations of the results of completed tasks; evaluation of the performance of independent works; control works of thematic and modular control; final control (credit).

### 9. Scheme of scoring

Academic achievements are evaluated on a 100-point scale throughout the semester. During the semester, the applicant can receive 60 points for all types and forms of work, having passed the credit - 40 points

Name of type of activity and control	Maximum number of points per unit	Section 1		Section 2	
		Number of units	Maximum number of points	Number of units	Maximum number of points
Attending lectures		5	2	10	4
Preparation and work at a seminar class		5	5	10	10
Work on a practical class					
Laboratory work (including admission, execution, protection)					
Completing tasks for self-study		6	6	7	14
Module control			7		12
Execution and protection of an individual research task					
In total			20		40
Credit	40				
Maximum number of points: 100					

### Scale of evaluation

The sum of points for all types of learning activities during the semester	Evaluation	
	for a four-level rating scale	for a two-level rating scale
90 – 100	perfectly	Accrued/Passed
70-89	good	
50-69	satisfactory	
1-49	unsatisfactory	Not credited /Fail

### 10. Recommended Literature

#### Main Literature



1. Blyznyuk T. Cyfrovi instrumenty dlya onlajn i oflajn navchannya [Digital tools for online and offline education]: navch.-metod. posibnyk. Ivano-Frankivsk: Prykarpatskyj nacionalnyj universytet imeni Vasylya Stefanyka, 2021. 64 s. (In Ukraine)

2. Gurevych R. S., Kademiya M. Yu., Opushko N. R., Ilniczka T. S., Plaxotnyuk G. M. Rol cyfrovyykh tekhnologiy navchannya v epoxu cyvilizacijnykh zmin [The role of digital learning technologies in the era of civilizational changes]. Suchasni informacijni tekhnologiyi ta innovacijni metody`ky` navchannya v pidgotovci faxivciv: metodologiya, teoriya, dosvid, problemy. Vyp. 62. S. 28-38. (In Ukraine)

3. Sobchenko T. M., Tkachov A. S., Tkachova N. O. Formuvannya informacijno-cyfrovoyi kompetentnosti majbutnix uchyteliv v osvitnomu seredovyshhi pedagogichnogo universytetu [Formation of information and digital competence of future teachers in the educational environment of a pedagogical university]. Naukovyj visnyk Uzhgorodskogo universytetu. Seriya: «Pedagogika. Socialna robota». 2022. Vyp. 2 (51). S.145-148. DOI: 10.24144/2524-0609.2022.51.145-148. (In Ukraine)

4. Sobchenko T. M. Vykorystannya cyfrovyykh instrumentiv u pislyadyplomnij pedagogichnij osviti [The use of digital tools in postgraduate pedagogical education]. Naukovyj visnyk Uzhgorodskogo universytetu. Seriya: «Pedagogika, socialna robota». 2021. Vyp. 1 (48). S. 384–386. (In Ukraine)

5. Teoretychni osnovy pidvyshhennya doslidnyczkoyi spromozhnosti universytetiv Ukrayiny v konteksti implementaciji koncepciyi «Vidkryta nauka» [Theoretical foundations of increasing the research capacity of Ukrainian universities in the context of the implementation of the "Open Science" concept: preprynt (analitychni materialy)] / V. Lugovyj, I. Drach, O. Petroye, V. Zinchenko, Yu. Myelkov, I. Zhylyayev, I. Regejlo, N. Bazelyuk, V. Kamyshyn; za red. V. Lugovogo, O. Petroye. Kyiv: Instytut vyshhoyi osvity NAPN Ukrayiny, 2021. 206 s. (In Ukraine)

#### **Additional Literature**

6. Bazelyuk O. Metodologichni pidxody do rozvytku cyfrovoyi kultury pedagogichnykh pracivnykiv zakladiv profesijnoyi osvity. Ukrayinskyj pedagogichnyj zhurnal. 2019. # 4. S. 64-71. (In Ukraine)

7. Lapayenko S. V. Teoretyko-metodologichne zabezpechennya cyfrovoyi transformaciji osvity i pedagogiky [Methodological approaches to the development of digital culture of pedagogical workers of vocational education institutions]. Innovacijna pedagogika. Innovacijna pedagogika. Vyp. 55. T. 3. S. 9-13. (In Ukraine)

8. Pasmor N. P. Cyfrovi servisy e-nauky: bibliotechnyj kontekst [Digital services of e-science: library content]. Naukovo-doslidnyj instytut pravovogo zabezpechennya innovacijnogo rozvytku. URL: [https://ndipzir.org.ua/wp-content/uploads/2019/05.04.19/05\\_04\\_2019-97-103.pdf](https://ndipzir.org.ua/wp-content/uploads/2019/05.04.19/05_04_2019-97-103.pdf). (In Ukraine)

#### **Посилання на інформаційні ресурси в Інтернеті, відеолекції, інше методичне забезпечення**

9. Cyfrovi instrumenty dlya naukvciv [Digital tools for scientists.]. URL: <https://nauka.gov.ua/information/tsyfrovi-instrumenty-dlia-naukovtsiv/> (In Ukraine)

10. Cyfrova adzhenda Ukrayiny – 2020 [Digital agenda of Ukraine – 2020. URL: <https://ucci.org.ua/uploads/files/58e78ee3c3922.pdf> (In Ukraine)

11. Instrumenty dlya doslidzhen. URL: <https://www.library.kpi.ua/research/instrumenty-dlya-doslidzhen/> (In Ukraine)

12. Ukrayina doyednalasya do mizhnarodnoyi innovacijnoyi programy «Transformaciya cyfrovoyi pedagogiky» [Ukraine joined the international innovation program "Transformation of Digital Pedagogy"]. URL: <https://mon.gov.ua/ua/news/ukrayina-doyednalasya-do-mizhnarodnoyi-innovacijnoyi-programi-transformaciya-cifrovoyi-pedagogiki#:~:text=Ukrayina%20stala%2017-oyu%20krayinoyu/> (In Ukraine)