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Modernization of Pedagogical Higher Education
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| CONCEPT COURSE¹ | | |
|---|------------------------------------|---|
| HIGHER EDUCATIONAL INSTITUTION | | USPU |
| Institute (faculty), department or other structural subdivision, on which the discipline is fixed | | Faculty of Physics, Mathematics and Informatics Department of Informatics and Information Communication Technologies |
| DESCRIPTION OF EDUCATIONAL DISCIPLINE | | |
| 1 | Name of the discipline | Cloud and mobile technology in education |
| 2 | Module code | |
| 3 | Cycle / level of higher education | FQ – EHEA – first cycle, QF-LLL – 6 level, HPK – 6 level |
| 4 | Higher education degree | bachelor |
| 5 | Branch of knowledge | 01 Education |
| 6 | Specialty, specialization (if any) | 014 Secondary education (Informatics) |
| 7 | The name of the educational | Secondary education (Informatics) |

¹ The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



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| | program, in which the discipline is included | |
| 8 | Educational qualification to be awarded | Teacher of informatics |
| 9 | Characteristics of the discipline in the form of studies | fulltime, part-time |
| 10 | Discipline status | Compulsory |
| 11 | Prerequisites for the discipline study | Informatics |
| 12 | Year of training, semester. | 1 year, 2 semester |
| 13 | The scope of discipline in ECTS credits and its distribution in hours by the forms of organization of educational process and types of training sessions | <i>3,0 credits ECTS. Total hours: 90, including full-time studies: 16 lecture hours, 14 hours of laboratory classes, 14 hours of practical classes, 46 hours - consultations, individual work of students; For part-time studies - 6 lecture hours, 4 hours of laboratory classes, 4 hours of practical classes, 76 hours - consultations, individual work of students.</i> |
| 14 | Form of final control | Exam |
| 15 | Learning language | Ukrainian, English |
| 16 | Internet address of the permanent placement of educational content of the discipline | https://moodle.dls.udpu.edu.ua/course/view.php?id=9066 password: 123456 |
| 17 | Developer (s) | Candidate of Pedagogical Sciences, Associate Professor, Head of the Department of Informatics and Information Communication Technologies Medvedieva Mariia Oleksandrivna |



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Brief summary of the discipline

To solve theoretical and practical problems that arise in the process of human activity in various fields of science, education, technology and production in order to free a person from excessive intellectual load, the use of computer technology has a great effect provided sufficient software and efficient use. Students and pupils are increasingly using mobile phones, tablets and other gadgets, the main purpose of which they see in entertainment and games, although the possibilities for use are much wider. That is why the teachers of the education system face the task of providing the educational process with high-quality electronic learning tools, but not only for computers but also for other modern devices that could be used for the educational process in both secondary education institutions and higher education institutions (SEIs and HEIs) and in extracurricular activities.

As a result, one of the urgent issues is the use of Internet resources in the educational process of SEIs and HEIs. And such new technologies as virtual, web, cloud help to change the learning environment, as well as to make education (whether higher or secondary) more accessible.

Discipline "Cloud and Mobile Technologies in Education" *is intended for students of the specialty 014 "Secondary Education (Computer Science)"* and aims to familiarize with the main methodologies of cloud and mobile technologies in education; a general overview of the main cloud and mobile technologies and the consideration of the main provisions of cloud and mobile technologies for use in education.

Key concept

Cloud technologies, mobile technologies, information and communication technologies, mobile learning, cloud computing.

The aim of studying discipline

Providing the formation of informational and digital competence of the teacher, which determines his readiness to solve professional problems using cloud and mobile technologies, to participate in the construction of the informational educational environment.

Program competencies that are formed during the study of discipline

| | |
|--|---|
| Integral competence (IC) | Ability to solve complex specialized practical problems in the field of secondary education, which involves the application of conceptual methods of educational sciences, psychology, theory and methods of teaching and is characterized by complexity and uncertainty of the educational process in secondary education. |
| General competences (GC) | GC 1. Ability to apply knowledge in practical situations. GC2. Skills in the use of information and communication technologies. |
| Professional (special) competencies (P _s C) | PsC 1. Ability to use knowledge of scientific facts, concepts, theories, principles and methods of computer science in the practice of teaching computer science in basic secondary school. FSK 2. Ability to master and use scientific and technical achievements in the field of |



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informatization of education to create electronic educational resources, their certification, organization of e-learning, learning using distance learning technologies, computer support of the educational process in accordance with applicable regulations requirements.

Intended learning outcomes of the discipline

| Learning Outcomes ² | Forms and Methods of evaluation ³ |
|--|--|
| Professional knowledge | |
| 1. Knows the main historical stages of the subject area development. | <i>Oral questioning and test control</i> |
| 2. Knows and understands principles, modern methods, basic methodical techniques, forms of organization of training for a certain subject in institutions of general secondary education (level of basic secondary education). | <i>Oral questioning and test control</i> |
| Professional skills and abilities | |
| 1. Works with basic categories and concepts of specialty. | <i>Oral questioning and test control</i> |
| 2. Selects and applies modern educational | <i>Training project</i> |

² National qualifications framework. Appendix to the Resolution of the Cabinet of Ministers of Ukraine of November 23, 2011 № 1341 (as amended by the Resolution of the Cabinet of Ministers of Ukraine of June 25, 2020 № 519). Access mode: [https://zakon.rada.gov.ua/laws/show/1341-2011- %D0%BF/para12#n12](https://zakon.rada.gov.ua/laws/show/1341-2011-%D0%BF/para12#n12) (Національна рамка кваліфікацій. Додаток до постанови Кабінету Міністрів України від 23 листопада 2011 р. № 1341 (в редакції постанови Кабінету Міністрів України від 25 червня 2020 р. № 519). Режим доступу: [https://zakon.rada.gov.ua/laws/show/1341-2011- %D0%BF/para12#n12](https://zakon.rada.gov.ua/laws/show/1341-2011-%D0%BF/para12#n12))

³ Summative assessment (SA1, SA2...); formative assessment (FA1, FA2...).(Підсумкова оцінка (ПО1, ПО2...); формувальне оцінювання (ФО1, ФО2...)).



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| technologies for formation in students subject competences and carries out self-analysis of the effectiveness of lessons. | |
| Communication | |
| 1. Able to appreciate diversity and multiculturalism, guided by modern ethical norms, principles of tolerance, dialogue and cooperation. | <i>Oral questioning and test control</i> |
| Autonomy and responsibility | |
| 1. <i>Knows and understands</i> the structure of the subject field of informatics, its place in the system of sciences, understands the prospects of the development of informatics and information technologies, their social significance. | <i>Oral questioning</i> |
| 2. <i>Knows and understands</i> the ways of binary coding of text, numeric, graphical, audio and video information. | <i>Oral questioning and test control</i> |
| 3. <i>Knows and understands</i> the ethical and legal principles of using information and communication technologies; is able to implement means and methods of information protection and security in the | <i>Oral questioning and test control</i> |



| Internet. | | | | | | | | | | | | | | | | | | | | | |
|--|---|------------------|-----------------------|------------------|----------|--------|-----|----|-----|--------|-----|----|-----|-----|----|--|----|-----|----|--|----|
| 4. <i>Ability to use</i> information and communication technologies for presenting, editing, storing and converting text, numeric, graphic, audio and video information. | <i>Activity on practical and laboratory classes</i> | | | | | | | | | | | | | | | | | | | | |
| 5. <i>Ability to apply</i> cloud and mobile technologies in the classroom and in extracurricular work. | <i>Activity on practical and laboratory classes</i> | | | | | | | | | | | | | | | | | | | | |
| Control of academic achievements of students | | | | | | | | | | | | | | | | | | | | | |
| Criteria for learning outcomes assessment | <i>According to each planned result of discipline studies</i> | | | | | | | | | | | | | | | | | | | | |
| Diagnostic tools for learning outcomes (formative and summative assessment) | <i>Exam, activity in practical and laboratory classes, control work, individual research tasks, team projects, tasks for individual work, standardized tests, presentation of research results.</i> | | | | | | | | | | | | | | | | | | | | |
| List of questions for final control | | | | | | | | | | | | | | | | | | | | | |
| Summative assessment and feedback. Summarizing marks. | <p>The assessment system consists of the following types of educational activities: 14 interim creative writings to estimate PsC 1 (28%) and PsC 2 (28%). Activity in practical and laboratory lessons to estimate PsC-1 (14%) and PsC-2 (14%). Final exam in which PsC-1 (5%) and PsC-2 (6%) is assessed. Work to assess the general competencies of GC 1 (3%) and GC2 (3%). The final score will be obtained as follows: the final score is PsC -1 (28% + 14%+5%) + PsC -2 (28% + 14% + 5%) + GC 1 (3%) + GC 2 (3%).</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Competences</th> <th>Current assessment, %</th> <th>Final control, %</th> <th>Total, %</th> </tr> </thead> <tbody> <tr> <td>PsC -1</td> <td>42%</td> <td>5%</td> <td>47%</td> </tr> <tr> <td>PsC -2</td> <td>42%</td> <td>5%</td> <td>47%</td> </tr> <tr> <td>GC1</td> <td>3%</td> <td></td> <td>3%</td> </tr> <tr> <td>GC2</td> <td>3%</td> <td></td> <td>3%</td> </tr> </tbody> </table> | Competences | Current assessment, % | Final control, % | Total, % | PsC -1 | 42% | 5% | 47% | PsC -2 | 42% | 5% | 47% | GC1 | 3% | | 3% | GC2 | 3% | | 3% |
| Competences | Current assessment, % | Final control, % | Total, % | | | | | | | | | | | | | | | | | | |
| PsC -1 | 42% | 5% | 47% | | | | | | | | | | | | | | | | | | |
| PsC -2 | 42% | 5% | 47% | | | | | | | | | | | | | | | | | | |
| GC1 | 3% | | 3% | | | | | | | | | | | | | | | | | | |
| GC2 | 3% | | 3% | | | | | | | | | | | | | | | | | | |



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| | <p>Information about the accomplishment of practical writings, individual and creative writings and independent work etc results is demonstrated with every student personally and for the whole group in general.</p> <p>Information about the evaluation point of individual and creative writings accomplishment is performed for a student (a group of students); the results of writing accomplishments are presented by them (including public).</p> <p>Student's results of writing accomplishments on practical and laboratory lessons are performed according to lesson schedule.</p> <p>Results of final control (examination) are demonstrated for students on the day of the examination. Individual and online tutorials are performed with the interactive communication apps (Google Meet, Telegram, Viber, WhatsApp).</p> | | | | | | | | | | | |
| Evaluation scale of the institution of higher education | The amount of points for all types of educational activities | | | | | | National scale marks | | | | | |
| | 90 – 100(A) | | | | | | Excellent | | | | | |
| | 82 – 89(B) | | | | | | Good | | | | | |
| | 75 – 81(C) | | | | | | Good | | | | | |
| | 68 – 74(D) | | | | | | Satisfactory | | | | | |
| | 61 – 67(E) | | | | | | Satisfactory | | | | | |
| | 35 – 60(FX) | | | | | | Poor with the possibility of retake | | | | | |
| 1 – 34(F) | | | | | | Poor with compulsory repeated studying of the discipline | | | | | | |
| Structure of the discipline | | | | | | | | | | | | |
| <i>Names of content modules and topics</i> | <i>Number of hours</i> | | | | | | | | | | | |
| | <i>Full-time studies</i> | | | | | | <i>Part-time studies</i> | | | | | |
| | <i>total</i> | <i>including</i> | | | | | <i>усього</i> | <i>including</i> | | | | |
| | | <i>l</i> | <i>p</i> | <i>lab</i> | <i>ind</i> | <i>i.w.</i> | | <i>l</i> | <i>p</i> | <i>lab</i> | <i>ind</i> | <i>i.w.</i> |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 13 |
| Module 1 | | | | | | | | | | | | |



| Content module 1 | | | | | | | | | | | | |
|---|-----------|----------|---|-----------|--|-----------|-----------|----------|---|----------|--|-----------|
| <i>Cloud technologies in education</i> | | | | | | | | | | | | |
| Topic 1. <i>Models of cloud services provision</i> | 6 | 1 | | 1 | | 4 | 6 | 1 | | | | 5 |
| Topic 2. <i>Architecture and offers from leading cloud service companies</i> | 6 | 1 | | 1 | | 4 | 6 | | | | | 6 |
| Topic 3. <i>Experience of using cloud technologies abroad</i> | 6 | 1 | | 2 | | 3 | 6 | | | | | 6 |
| Topic 4. <i>Creation of Internet surveys by means of cloud technologies</i> | 6 | 1 | | 2 | | 3 | 6 | | | 2 | | 4 |
| Topic 5. <i>Cloud services as a replacement for office applications: creation of presentations by means of cloud technologies</i> | 6 | 1 | | 2 | | 3 | 6 | 1 | | 1 | | 4 |
| Topic 6. <i>Cloud services as a replacement for office applications: creating documents with sharing rights to multiple users</i> | 6 | 1 | | 2 | | 3 | 6 | 1 | | 1 | | 4 |
| Topic 7. <i>Cloud storage as a replacement for drives: comparative characteristic</i> | 6 | 1 | | 2 | | 3 | 6 | 1 | | | | 5 |
| Topic 8. <i>Cloud LMS: designing of cloud-based learning environments</i> | 6 | 1 | | 2 | | 3 | 6 | | | | | 6 |
| Total with content module 1 | 48 | 8 | | 14 | | 26 | 48 | 4 | | 4 | | 40 |
| Content module 2 | | | | | | | | | | | | |
| <i>Mobile learning technologies</i> | | | | | | | | | | | | |
| Topic 1. <i>Mobile technologies and mobile learning technologies</i> | 7 | 1 | 2 | | | 4 | 8 | | | | | 8 |
| Theme 2. <i>Didactic possibilities of using mobile technologies in education</i> | 9 | 1 | 4 | | | 4 | 8 | 1 | 1 | | | 6 |



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|---|-----------|-----------|-----------|-----------|--|-----------|-----------|----------|----------|----------|--|-----------|
| Topic 3. Overview of mobile Internet services for the organization of the educational process | 10 | 2 | 4 | | | 4 | 8 | 1 | 1 | | | 6 |
| Topic 4. Multimedia technologies in education | 8 | 2 | 2 | | | 4 | 9 | | 1 | | | 8 |
| Topic 5. Electronic educational resources | 8 | 2 | 2 | | | 4 | 9 | | 1 | | | 8 |
| Total with content module 2 | 42 | 8 | 14 | | | 20 | 42 | 2 | 4 | | | 36 |
| <i>Total number of hours</i> | 90 | 16 | 14 | 14 | | 46 | 90 | 6 | 4 | 4 | | 76 |

Educational discipline program (content block)

| Module / Topic | Topics of seminars / practical / laboratory classes (if any) | Approximate topics for individual and / or group tasks (if any) | Task for individual work |
|--|--|--|--|
| Content module 1. Cloud technologies in education | | | |
| Topic 1. <i>Models of cloud services provision</i> | Topic 1. <i>Models of cloud services provision</i> | | <i>Create a report in the Word document with screenshots describing the main models of providing cloud services according to the option.</i> |
| Topic 2. <i>Architecture and offers from leading cloud service companies</i> | Topic 2. <i>Architecture and offers from leading cloud service companies</i> | | <i>1. Create a report in the Word document with screenshots (if necessary) describing the architecture and suggestions from leading service companies. 2. Develop a presentation on the topic: "Cloud Platforms" by means of cloud service tools</i> |
| Topic 3. <i>Experience of using cloud technologies abroad</i> | Topic 3. <i>Experience of using cloud technologies abroad</i> | | <i>Write a summary on the topic according to the variant.</i> |



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| Topic 4. <i>Creation of Internet surveys by means of cloud technologies</i> | Topic 4. <i>Creation of Internet surveys by means of cloud technologies</i> | | <ol style="list-style-type: none">1. <i>By means of cloud services, create an Internet survey on the topic: "The Benefits of Using Cloud Technologies in Education"</i>2. <i>Create a report in the Word document with screenshots describing the phased creation of online surveys by cloud-based technologies.</i>3. <i>Explain the benefits of using cloud services to create online surveys.</i> |
| Topic 5. <i>Cloud services as a replacement for office applications: creation of presentations by means of cloud technologies</i> | Topic 5. <i>Cloud services as a replacement for office applications: creation of presentations by means of cloud technologies</i> | | <ol style="list-style-type: none">1. <i>Develop a presentation on the topic: "Cloud technologies in education" by means of cloud services</i>2. <i>Create a report in the Word document with screenshots describing the step-by-step creation of presentations using cloud-based technologies.</i> |
| Topic 6. <i>Cloud services as a replacement for office applications: creation of documents sharing rights with multiple users</i> | Topic 6. <i>Cloud services as a replacement for office applications: creation of documents sharing rights with multiple users</i> | | <ol style="list-style-type: none">1. <i>Create the document by means of cloud services sharing rights with several users</i>2. <i>Create a report in the Word document with screenshots describing the phased creation of the document by giving access to several users.</i>3. <i>Give examples of benefits of using such services.</i> |
| Topic 7. <i>Cloud storage as a replacement for drives: comparative characteristic</i> | Topic 7. <i>Cloud storage as a replacement for drives: comparative characteristic</i> | | <ol style="list-style-type: none">1. <i>By means of cloud services, develop the presentation on the topic: "Comparative characteristics of cloud storage"</i>2. <i>Using cloud storage, share your</i> |



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| | | | <i>documents with other users. Describe it step by step with the description of actions. 3. Describe the comparative characteristics of cloud storage.</i> |
| <i>Topic 8. Cloud LMS: designing of cloud-based learning environments</i> | <i>Topic 8. Cloud LMS: designing of cloud-based learning environments</i> | | <i>1. Describe the existing cloud-based learning environments in foreign countries. 2. Describe the existing cloud-based learning environments in Ukraine. 3. Describe the comparative characteristics of cloud LMS.</i> |
| Content module 2. Cloud technologies in education | | | |
| <i>Topic 1. Mobile technologies and mobile learning technologies</i> | <i>Topic 1. Mobile technologies and mobile learning technologies</i> | | <i>Create a report in the Word document with the description of differences between concepts "Mobile Technologies" and "Mobile Learning Technologies" giving examples.</i> |
| <i>Topic 2. Didactic possibilities of using mobile technologies in education</i> | <i>Topic 2. Didactic possibilities of using mobile technologies in education</i> | | <i>Review didactic possibilities of using mobile technologies in education</i> |
| <i>Topic 3. Overview of mobile Internet services for the organization of the educational process</i> | <i>Topic 3. Overview of mobile Internet services for the organization of the educational process</i> | | <i>Describe the most common Internet services for organizing the educational process</i> |
| <i>Topic 4. Multimedia technologies in education</i> | <i>Topic 4. Multimedia technologies in education</i> | | <i>According to the option, develop the multimedia educational tool</i> |
| <i>Topic 5. Electronic educational resources</i> | <i>Topic 5. Electronic educational resources</i> | | <i>Create your own e-learning resource according to the option</i> |
| Technological and resource support, the use of which the discipline implies (if necessary) | | | |
| <i>Innovative learning technologies (Teaching)</i> | <i>Technology of critical thinking development, technology of inquiry learning, integrated learning technology,</i> | | |



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| | mobile learning technology, flipped learning technology, person-oriented learning, mixed learning, distance learning technology, etc. |
| The use of digital tools in teaching study discipline | Laptops, netbooks, ultrabooks, e-books, Internet tablets, ultra-mobile PCs, thin PCs, pocket PCs, smartphones, mobile phones. |
| Material and technical support | Modular furniture, computer equipment, teaching and methodical support. |
| The use of opportunities of the innovative classroom as a component of the educational ecosystem MoPED | Implementation of innovative teaching technologies to provide the educational process in discipline. |
| Software (on request) and teaching and methodological support | Software: application software, information resources, presentation tools, cloud services, e-learning resources, text editors, etc. Educational and methodical support: educational-methodical complex of the discipline. |
| Recommended sources of information (including electronic resources) | <p>1. Basic:</p> <ol style="list-style-type: none"> 1) Vakalyuk T.A. Hmarni texnologiyi v osviti. Navchal`no-metody`chny`j posibny`k dlya studentiv fizy`ko-matematy`chnogo fakul`tetu. Zhy`tomy`r : vy`d-vo ZhDU, 2016. 72 s. 2) Medvedyeva M.O. Mobil`ni texnologiyi v osvitr`omu procesi : navch. posib. Uman` : Vizavi, 2019. 120 s. <p>Additional:</p> <ol style="list-style-type: none"> 1) Vakaliuk Tetiana. Advantages and disadvantages of use cloud data warehouse / Tetiana Vakaliuk, Mariia Medvedieva // Journal L'Association 1901 "SEPIKE". – Frankfurt, Deutschland. – Poitiers, France. – Los Angeles, USA. – Edition 11. – 2015. – P. 104-106. 2) Sejdametova Z. S. Oblachnyye texnologiy`y` obrazovany`e / Sejdametova Z. S., Ablyaly`mova E. Y`. , Medzhy`tova L. M., Sejtvely`eva S. N., Temnenko V. A. [pod obshh. red. Z. S. Sejdametovoj]. – Sy`mferopol` : "DY`AJPY`", 2012. – 204 s. 3) Semerikov S. O. Hmarni texnologiyi navchannya: vy`toky` / O. M. Markova, S. O. Semerikov, A. M. Stryuk // Informacijni texnologiyi i zasoby` navchannya. – 2015. – #2 (46). – S. 29-44. – Rezhy`m dostupu do zhurn. : http://journal.iitta.gov.ua/index.php/itlt/article/view/1234/916#.VfFO4NLtmko. 4) Stryuk A. M. Sy`stema hmaro oriyentovany`h zasobiv navchannya yak element informacijnogo osvitr`o-naukovogo seredovy`shha VNZ [Elektronny`j resurs] / A. M. Stryuk, M. V. Rassovy`cz`ka |



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// Informacijni tehnologiyi i zasoby` navchannya. – 2014. – #4 (42). – S. 150-158. – Rezhy`m dostupu do zhurn. : <http://journal.iitta.gov.ua/index.php/itlt/article/view/1087/829>.

- 5) Shy`shkina M. P. Hmaro oriyentovane osvityne seredovy`shhe navchal`nogo zakladu: suchasny`j stan i perspekty`vy` rozvy`tku doslidzhen` [Elektronny`j resurs] / M. P. Shy`shkina, M. V. Popel` // Informacijni tehnologiyi i zasoby` navchannya. – 2013. – #5 (37). – S. 66-80. – Rezhy`m dostupu do zhurn. : <http://journal.iitta.gov.ua/index.php/itlt/article/view/903/676>.

2. Other:

The system of internal quality provision of teaching the discipline

Survey of students about the quality of teaching the course, the results of their success.

Feedback from independent experts on the quality of teaching discipline.