**Al-Farabi Kazakh National University**

**Faculty biology and biotechnology**

**Department of Biophysics, Biomedicine and Neuroscience**

**APPROVED by**

**Dean of Faculty**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Zayadan B.K.**

**Protocol № 9 “24” 05 2023**

**EDUCATIONAL-METHODICAL COMPLEX OF DISCIPLINE**

**TsKBO 6308** - **Digital content in biology education**

«7M01504 - Biology» speciality

Course – 2

Semester – 3

Number of credit-9

Lecture-30 hours

Seminar-60 hours

IWST-7

**Almaty 2023**

Educational-methodical complex of the discipline is compiled by Ashirova Zh. (PhD)

Based on educational program of Specialty «7M01504 - Biology »

Considered and recommended at the meeting of the department Biophysics, Biomedicine and Neuroscience

« 17 » 05 2023 year, protocol №\_27\_

Head of Department,

Professor \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A. Kustubayeva

**SYLLABUS**

**Fall semester 2023-2024 academic year**

**Educational program "Digital content in biology education"**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID**  **and name**  **of course** | | **Independent work**  **of the student**  **(IWS)** | | | | **Number of credits** | | | | **General**  **number**  **of credits** | **Independent work**  **of the student**  **under the guidance**  **of a teacher (IWST)** |
| **Lectures (L)** | **Practical classes (PC)** | | **Lab. classes (LC)** |
| **TsKBO 6308** | | 98 | | | | 30 | 60 | | - | 9 | 7 |
| **ACADEMIC INFORMATION ABOUT THE COURSE** | | | | | | | | | | | |
| **Learning Format** | | **Cycle,**  **component** | | **Lecture**  **types** | | | **Types**  **of practical classes** | | | **Form and platform final control** | |
| Offline | | Theoretical, Practical | | Problematic | | | Problematic solving,  Situational tasks | | | On univer system test | |
| **Lecturer - (s)** | | Ashirova Zhadyra Berdimuratovna | | | | | | | |
| **e-mail :** | | ashirova.zhadyra@kaznu.kz | | | | | | | |
| **Phone :** | | +77714670970 | | | | | | | |
| **Assistant - (s)** | | Kenzheyeva Zhanar Kuralbayevna | | | | | | | |
| **e-mail :** | | Zhanar.kanzheyeva@kaznu.kz | | | | | | | |
| **Phone :** | | +77022779106 | | | | | | | |
| **ACADEMIC COURSE PRESENTATION** | | | | | | | | | | | |
| **Purpose**  **of the course** | | **Expected Learning Outcomes (LO) \***  As a result of studying the discipline the undergraduate will be able to: | | | | | | | | **Indicators of LO achievement (ID)**  (for each LO at least 2 indicators) | |
|  | | 1. Develop principles for the introduction and use of information and communication technologies in the educational process;  Bloom's taxonomy, case study, Smart technology. | | | | | | | | * 1. To understand the principles, concepts and issues related to the use of digital technologies to support learning and apply them in their practice | |
| 1.2. To analyze existing applications of locally available digital technologies or allow you to conduct new educational activities | |
| 2. Implement the application of information and communication technologies of biology training in practice; | | | | | | | | 2.1. To examine how and why digital technologies can be used to support students ' learning and challenges | |
| 2.2. Defines how and why digital technologies has used in their practice to support learning and promote learning, with reference to relevant concepts, principles and theories. | |
| 3. Apply methodological foundations for the design and implementation of field and laboratory biological research using modern equipment and computing complexes, | | | | | | | | 3.1. To develop the ability to find and choose appropriate digital technologies and related activities to increase and motivate students to support specific learning goals | |
| 3.2. Apply modern computer technologies to solve research and production and technical tasks of professional activity in education process | |
| 4. Find and evaluate the modern distance learning technologies in learning biology practice; | | | | | | | | 4.1. Increases the ability to plan, execute, and evaluate learning episodes using digital technologies. | |
| 4.2. Evaluates digital technologies to support learning and support learning. | |
| 5. Mastering the skills of computer processing of experimental results | | | | | | | | 5.1 Create a short-term projects in order to master the skills in administrating learning process | |
| 5.2. Find and evaluate different platforms, sites, programs, gadgets for composing lessons for biology learning process | |
| **Prerequisites** | | Information and communication technologies | | | | | | | | | |
| **Postrequisites** | | Methods of teaching biology | | | | | | | | | |
| **Learning Resources** | | **Main Literature:**   1. 1. Teaching and Digital Technologies: Big Issues and Critical Questions Paperback. January 8, 2016 by Michael Henderson (Editor), Geoff Romeo (Editor) 2. 2. Forsyth, E. (2016). Using videoconferencing for professional development and meetings. Computers in Libraries, 36(7), 11-14. 3. 3. Remis, K. K. (2015). LMS enhances K12 instruction: Systems increase engagement, provide quick access to digital resources and help teachers with administrative tasks. District Administration, Digital Edition, May 27, 2015<http://www.districtadministration.com/article/lms-enhances-instruction> 4. 4. Dominic, M. (2016). Handbook of Research on Mobile Learning in Contemporary Classrooms. Hershey, PA: IGI Global. 5. **Additional Literature:** 6. 5. Korakakis, G. G., Pavlatou, E. A., Palyvos, J. A. and Spyrellis, N. N. (2009) “3D visual ization types in multimedia applications for science learning: A case study for 8th grade studen ts in Greece”, Computers & Education, Vol 52, pp 390‐401. 7. 6. Biancarosa, G., & Griffiths, G. C. (2012). Technology tools to support reading in the digital age. The Future of Children, 22(2), 139-160.<http://www.jstor.org/stable/23317415?seq=1&cid=pdf-reference#page_scan_tab_contents>   **Research infrastructure**   1. 1. Ess, C. 2020. Digital Media Ethics. 3rd Edition. Cambridge: Polity Press. 2. 2. Jordan, T. 2013. Hacking: Digital Media and Technological Determinism. Cambridge: Polity Press 3. 3. Dancyger, K. (2018). The technique of film and video editing: history, theory, and practice. Routledge   **Internet resources (at least 3-5)**   1. <http://elibrary.kaznu.kz/ru> 2. <https://expresswriters.com/digital-content-strategy-guide/> 3. <https://prezi.com/> 4. <https://www.clearslide.com/> 5. <https://voicethread.com/> 6. <https://tophat.com/>   **Software**   1. <https://html.com/> 2. <https://wordpress.com/> 3. <https://www.sitecore.com/knowledge-center/> 4. <https://visme.co/blog/how-to-design-a-website/> | | | | | | | | | |
| **Academic**  **course policy** | | The academic policy of the course is determined by [the Academic Policy](https://univer.kaznu.kz/Content/instructions/%D0%90%D0%BA%D0%B0%D0%B4%D0%B5%D0%BC%D0%B8%D1%87%D0%B5%D1%81%D0%BA%D0%B0%D1%8F%20%D0%BF%D0%BE%D0%BB%D0%B8%D1%82%D0%B8%D0%BA%D0%B0.pdf) and [the Policy of Academic Integrity of Al-Farabi Kazakh National University .](https://univer.kaznu.kz/Content/instructions/%D0%9F%D0%BE%D0%BB%D0%B8%D1%82%D0%B8%D0%BA%D0%B0%20%D0%B0%D0%BA%D0%B0%D0%B4%D0%B5%D0%BC%D0%B8%D1%87%D0%B5%D1%81%D0%BA%D0%BE%D0%B9%20%D1%87%D0%B5%D1%81%D1%82%D0%BD%D0%BE%D1%81%D1%82%D0%B8.pdf)  Documents are available on the main page of IS Univer .  **Integration of science and education.** The research work of students, undergraduates and doctoral students is a deepening of the educational process. It is organized directly at the departments, laboratories, scientific and design departments of the university, in student scientific and technical associations. Independent work of students at all levels of education is aimed at developing research skills and competencies based on obtaining new knowledge using modern research and information technologies. A research university teacher integrates the results of scientific activities into the topics of lectures and seminars (practical) classes, laboratory classes and into the tasks of the IWST, IWS, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions andassignments.  **Attendance.** The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course. Failure to meet deadlines results in loss of points.  **Аcademic honesty.** Practical/laboratory classes, IWS develop the student's independence, critical thinking, and creativity. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of completing tasks are unacceptable.  Compliance with academic honesty during the period of theoretical training and at exams, in addition to the main policies, is regulated by [the "Rules for the final control"](https://univer.kaznu.kz/Content/instructions/%D0%9F%D1%80%D0%B0%D0%B2%D0%B8%D0%BB%D0%B0%20%D0%BF%D1%80%D0%BE%D0%B2%D0%B5%D0%B4%D0%B5%D0%BD%D0%B8%D1%8F%20%D0%B8%D1%82%D0%BE%D0%B3%D0%BE%D0%B2%D0%BE%D0%B3%D0%BE%20%D0%BA%D0%BE%D0%BD%D1%82%D1%80%D0%BE%D0%BB%D1%8F%20%D0%9B%D0%AD%D0%A1%202022-2023%20%D1%83%D1%87%D0%B3%D0%BE%D0%B4%20%D1%80%D1%83%D1%81%D1%8F%D0%B7%D1%8B%D0%BA%D0%B5.pdf) , ["Instructions for the final control of the autumn / spring semester of the current academic year"](https://univer.kaznu.kz/Content/instructions/%D0%98%D0%BD%D1%81%D1%82%D1%80%D1%83%D0%BA%D1%86%D0%B8%D1%8F%20%D0%B4%D0%BB%D1%8F%20%D0%B8%D1%82%D0%BE%D0%B3%D0%BE%D0%B2%D0%BE%D0%B3%D0%BE%20%D0%BA%D0%BE%D0%BD%D1%82%D1%80%D0%BE%D0%BB%D1%8F%20%D0%B2%D0%B5%D1%81%D0%B5%D0%BD%D0%BD%D0%B5%D0%B3%D0%BE%20%D1%81%D0%B5%D0%BC%D0%B5%D1%81%D1%82%D1%80%D0%B0%202022-2023.pdf) , "Regulations on checking students' text documents for borrowings".  Documents are available on the main page of IS Univer .  **Basic principles of inclusive education.** The educational environment of the university is conceived as a safe place where there is always support and equal attitude from the teacher to all students and students to each other, regardless of gender, race / ethnicity, religious beliefs, socio-economic status, physical health of the student, etc. All people need the support and friendship of peers and fellow students. For all students, progress is more about what they can do than what they can't. Diversity enhances all aspects of life. All students, especially those with disabilities, can receive counseling assistance by phone / e- mail +77714670970 or via video link in MS Teams[ashirova.zhadyra@kaznu.kz](mailto:ashirova.zhadyra@kaznu.kz) **Integration MOOC (massive open online course).** In the case of integrating MOOC into the course, all students need to register for MOOC. The deadlines for passing MOOC modules must be strictly observed in accordance with the course study schedule.  **ATTENTION!** The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course, as well as in the MOOC. Failure to meet deadlines results in loss of points. | | | | | | | | | |
| **INFORMATION ABOUT TEACHING, LEARNING AND ASSESSMENT** | | | | | | | | | | | |
| **Score-rating letter system of assessment of accounting for educational achievements** | | | | | | | | **Assessment Methods** | | | |
| **Grade** | **Digital**  **equivalent**  **points** | | **points,**  **% content** | | **Assessment according to the traditional system** | | | **Criteria-based assessment** is the process of correlating actual learning outcomes with expected learning outcomes based on clearly defined criteria. Based on formative and summative assessment.  **Formative assessment is** a type of assessment that is carried out in the course of daily learning activities. It is the current measure of progress. Provides an operational relationship between the student and the teacher. It allows you to determine the capabilities of the student, identify difficulties, help achieve the best results, timely correct the educational process for the teacher. The performance of tasks, the activity of work in the classroom during lectures, seminars, practical exercises (discussions, quizzes, debates, round tables, laboratory work, etc.) are evaluated. Acquired knowledge and competencies are assessed.  **Summative assessment** -type of assessment, which is carried out upon completion of the study of the section in accordance with the program of the course.Conducted 3-4 times per semester when performing IWS. This is the assessment of mastering the expected learning outcomes in relation to the descriptors. Allows you to determine and fix the level of mastering the course for a certain period. Learning outcomes are evaluated. | | | |
| A | 4.0 \_ | | 95-100 | | Great | | |
| A- | 3.67 | | 90-94 | |
| B+ | 3.33 | | 85-89 | | Fine | | |
| B | 3.0 | | 80-84 | | **Formative and summative assessment** | | | **Points % content** |
| B- | 2.67 | | 75-79 | | Activity at lectures | | | 5 |
| C+ | 2.33 | | 70-74 | | Work in practical classes | | | 20 |
| C | 2.0 | | 65-69 | | Satisfactorily | | | Independent work | | | 25 |
| C- | 1.67 | | 60-64 | | Design and creative activity | | | 10 |
| D+ | 1.33 | | 55-59 | | Final control (exam) | | | 40 |
| D | 1.0 | | 50-54 | | TOTAL | | | 100 |
| FX | 0,5 | | 25-49 | | Unsatisfactory | | |
| F | 0 | | 0-24 | |
| **Calendar (schedule) for the implementation of the content of the course. Methods of teaching and learning.** | | | | | | | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **A week** | **Topic name** | **Number of hours** | **Max.**  **ball** |
| **Module 1** Digital content purposes and objectives | | | |
| **1** | **Lec 1.** The purpose, objectives and relationship of the subject of digital content in biological education with other sciences | **1** |  |
| **Sem 1.** To determine how and why digital technologies in biological education can be used in their practice, with reference to relevant concepts,  Principles and theories | 2 | 10 |
| **2** | **Lec 2.** Potential of digital technologies in education, methods of statistical control of the quality of Education | 1 |  |
| **Sem 2.** Development of principles and concepts related to the use of digital technologies in biological education (using the example of Microsoft word) | 2 | 10 |
| **IWST 1. Consultation on the implementation of IWS1 on the topic:**  Development of scientific publications on Master's topics using Microsoft programs**.** Development of a structural and logical scheme of the studied material.  ATTENTION: (number of IWS (2-5), IWST (6-7)  Independent work of students (IWS, colloquium, etc.) is estimated at 55-60% of the total points. | 1 | 25 |
| **3** | **Lec 3.** Features of the use of digital technologies in the school, the development of skills of the XXI century among students | 1 |  |
| **Sem 3.** Understand the problems associated with the use of digital technologies in biological education and apply them in their own practice (using the example of Microsoft excel) | 2 | 10 |
| **IWS 1.** «Development of scientific publications on Master's topics using Microsoft programs»  Project work – use any example of your report as a Master peace  Demonstrate at any available program. |  |  |
| **4** | **Lec 4.** Features of the use of digital technologies in biology lessons | 1 |  |
| **Sem 4.** Planning, preparing and conducting classes using one or more  digital technologies | 2 | 4 |
| **IWST 2. Colloquium – logical task**  Development of glossary of the course material. | 1 | 6 |
| **5** | **Lec 5.** The importance of using digital technologies in active and inclusive learning | 1 |  |
| **Sem 5.** Demonstrate how you can develop an active learning and inclusive learning environment using digital technologies, as well as engage and motivate students to learn. | 2 | 10 |
| **MODULE 2 Ways of digital content development** | | | |
| **6** | **Lec 6.** Stages and concept of composition of the electronic textbooks  Электрондық оқулықтар құрамының кезеңдері мен түсінігі https://stud.kz/referat/show/96732 | 1 |  |
| **Sem 6.** Research of electronic textbook compiling programs | 2 | **10** |
| **7** | **Lec 7.** Different tools for writing an e-book |  |  |
| **Sem 7.** Drawing up the content of an electronic textbook |  | **10** |
| **IWST 3. Consultation related to IWS 2. task** | 1 |  |
| **Midterm control 1** | | | **100** |
| **8** | **Lec 8.** Ways to add and edit video and audio recordings to an e-book or texts | 1 |  |
| **Sem 8.** Adding and editing video and audio recordings to an e-book or texts | 2 | **5** |
| **IWS 2.**  «The impact of using digital technologies on students ' learning»  Written Essay with practical explanation with examples, references and summary. Word file no less than 2 pages, New Roman shrift #12. |  | 15 |
| **9** | **Lec 9.** Formation of information and communication competence in biological education | 1 |  |
| **Sem 9.** Selection of appropriate digital technologies for the design of learning activities specific to the development of different skills | 2 | **10** |
| **10** | **Lec 10** Psychology of personality and interpersonal relationships in biological education using digital technologies | 1 |  |
| **Sem 10.** Identify strengths and directions in designing educational | 2 | **10** |
| **IWST 4. Colloquium Consultation on the implementation of IWS3** | 1 |  |
| **MODULE 3 Digital approaches of digital design education** | | | |
| **11** | **Lec 11** SMART Learning technology in biological education | 1 |  |
| **Sem 11.** Collaborative environment choosing the most effective form of lesson organization | 2 | **10** |
|  |  |
| **12** | **Lec 12** Review of the methodology and system of distance learning, Mass Open Online Courses | 1 |  |
| **Sem 12.** Analysis of modern technologies of online events | 2 | **10** |
| **IWST 5. Consultation questions-answers session** | 1 |  |
| **13** | **Lec 13** Use of multimedia technologies in biological education | 1 |  |
| **Sem 13.** Intensification of the educational process using multimedia technologies in biological education | 2 | **5** |
| **IWS 3.** Problems of organizing educational activities using digital technologies.  Report in presentation format made in Power point, no less than 7 slides with conclusion and used resources. |  | 15 |
| **14** | **Lec 14** Assessment of students' knowledge using digital technologies in biological education (Quiz programs) | 1 |  |
| **Sem 14.** Working with the Free Quiz Maker program | 2 | **10** |
| **IWST 6. Colloquium** Make a structural and logical diagram of the read material – logical task | 1 |  |
| **15** | **Lec 15** Features of working with Converter programs in biological education | 1 |  |
| **Sem 15.** Working with Freemake Video Converter | 2 | **10** |
| **IWST 7. Consultation on examination preparation** | 1 |  |
| **Midterm control 2** | | | **100** |
| **Final control (exam)** | | | **100** |
| **TOTAL for course** | | | **100** |

Dean \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_B.Zayadan

Head of Department \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_A. Kustubaeva

Lecturer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Zh. Ashirova

**Example 1. Written assignment "My professional history" (25% of 100% MC)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criterion** | **"Excellent"**  20-25% | **"Good"**  15-20% | **"Satisfactory"**  10-15% | **"Unsatisfactory"**  0-10% |
| **Understanding Theories**  **and concepts of professional identity and professionalism of a teacher** | Deep understanding of theories, concepts of professional identity and teacher professionalism. Relevant and relevant links (citations) to key sources are provided. | Understanding theories, concepts of professional identity and teacher professionalism. Links (citations) to key sources are provided. | Limited understanding of theories, concepts of professional identity and teacher professionalism. Limited references (citations) to key sources are provided. | Superficial understanding / lack of understanding of theories, concepts of professional identity and professionalism of the teacher.  Relevant references (citations) to key sources are not provided. |
| **Awareness of key issues of professional identity and professionalism of teachers in Kazakhstan** | Links well the key concepts of professional identity and teacher professionalism with the context of Kazakhstan. Excellent substantiation of arguments with evidence from empirical research (for example, based on interviews or statistical analysis). | Links the concepts of professional identity and teacher professionalism with the context of Kazakhstan. Supports arguments with evidence from empirical research. | Limited connection of the concepts of professional identity and professionalism of teachers with the context of Kazakhstan. Limited use of evidence from empirical research. | There is little or no connection between the concepts of a teacher's professional identity and the context of Kazakhstan. Little or no use of empirical research. |
| **Policy proposal or practical recommendations/suggestions** | Offers sound policy and/or practical recommendations, proposals for improving the professional identity and professionalism of teachers in Kazakhstan. | Offers some policy and/or practical recommendations, proposals for enhancing the professional identity and professionalism of teachers in Kazakhstan | Limited policy and practical recommendations. Recommendations are non-essential, not based on rigorous analysis, and are shallow. | Little or no policy and practice advice, or advice of very low quality. |
| **Letter,**  **APA style** | The writing demonstrates clarity, conciseness and correctness. Strictly follows the APA style. | The letter demonstrates clarity, conciseness and correctness. Basically follows the APA style. | The letter has some key errors and clarity needs to be improved. There are mistakes in following the APA style. | The writing is unclear, it is difficult to follow the content. Lots of mistakes in following the APA style. |

**Example 2. Group presentation "Teaching profession in Kazakhstan" (30% of 100% RK)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criterion** | **"Excellent"**  25-30% | **"Good"**  20-20% | **"Satisfactory"**  15-20% | **"Unsatisfactory"**  0 – 15% |
| **Understanding theories and concepts of the professional identity of the teacher and the teaching profession** | Deep understanding of theories, concepts of the professional identity of the teacher and the teaching profession. | Understanding theories, concepts of the professional identity of the teacher and the teaching profession. | Limited understanding of theories, concepts of the professional identity of the teacher and the teaching profession. | Superficial understanding / lack of understanding of theories, concepts of the professional identity of the teacher and the teaching profession. |
| **Awareness of key issues of the professional identity of the teacher and the teaching profession in Kazakhstan** | Competent correlation of the key concepts of the professional identity of the teacher and the teaching profession with the context of Kazakhstan. Excellent substantiation of arguments with evidence from empirical research (for example, based on interviews or statistical analysis). | There is a connection between the concepts of professional identity of a teacher and the teaching profession with the context of Kazakhstan. The arguments are backed by evidence from empirical research. | Limited correlation of the professional identity of the teacher and the concepts of the teaching profession with the context of Kazakhstan. Limited use of evidence from empirical research | Insignificant connection / lack of connection between the concepts of the teacher's professional identity and the context of Kazakhstan. Little or no empirical research is used. |
| **Pilot Study** | Excellent use of the results of pilot studies (interviews or surveys) in the presentation | Good use of the results of pilot studies (interviews or surveys) in the presentation. | Satisfactory use of the results of pilot studies (interviews or surveys) in the presentation. | Poor use of the results of pilot studies (interviews or surveys) in the presentation. |
| **Suggestion of policy or practical recommendations/suggestions** | Offers very good policy and/or practical advice or suggestions for improving the professional identity and teaching profession in Kazakhstan. | Offers some policy and/or practical recommendations or suggestions for improving the professional identity and teaching profession in Kazakhstan. | Limited policy and practical recommendations. Recommendations are non-essential, not based on rigorous analysis, and are shallow. | Little or no policy and practice advice, or advice of very low quality. |
| **Presentation,**  **teamwork** | Excellent, attractive presentation, excellent quality of visuals, slides, materials, excellent teamwork. | Good engagement, good quality visuals, slides or other materials, good teamwork. | Satisfactory level of involvement, satisfactory quality of materials, satisfactory level of teamwork. | Low engagement, low quality content, poor teamwork. |