MINISTRY OF HEALTH OF UKRAINE
BUKOVINIAN STATE MEDICAL UNIVERSITY

APPROVE
Vice-Rector of higher educational establishment on
Scientific and Pedagogical Work and International Relations
_____ Oksana GODOVANETS
«28» _____ 05 _____ 2025

SYLLABUS
of studying the discipline

«Modern Information Technologies»

Field of knowledge	22 Healthcare
Specialty	221 Dentistry
Educational degree	PhD
Educational year	I
Form of study	full-time, part-time, distance
Department	Medical and Biological Physics and Medical Informatics

Approved at a meeting of the department of medical and biological physics and medical informatics «___» _____ 202__ (Protocol №__).

Head of the Department _____ Volodymyr FEDIV

Approved by the subject methodical commission in medical and biological subjects of physiological and physicochemical profile «___» _____ 202__ (Protocol №__).

Chairman of the subject methodical commission _____ Svitlana TKACHUK

Chernivtsi – 2025

1. GENERAL INFORMATION ABOUT SCIENTIFIC AND PEDAGOGICAL WORKERS WHO TEACH THE DISCIPLINE

Department	Medical and Biological Physics and Medical Informatics
Surname, first name, patronymic of scientific and pedagogical staff, position, academic degree, academic title, e-mail	Ivanchuk Maria Anatoliivna – Associate Professor of the Higher Education Institution, Candidate of Physical and Mathematical Sciences, Associate Professor. ivanchuk.m@bsmu.edu.ua Olar Olena Ivanivna – Associate Professor of the Higher Education Institution, Candidate of Physical and Mathematical Sciences, Associate Professor olena.olar@bsmu.edu.ua
Department's webpage on the official website of the university	https://www.bsmu.edu.ua/biologichnoyi-fiziki-ta-medichnoyi-informatiki/
Website of the department	https://bphmi.bsmu.edu.ua/
E-mail	biophysics@bsmu.edu.ua
Address	O. Kobylianska St., 42
Contact phone number	+380372524544

2. GENERAL INFORMATION ABOUT THE DISCIPLINE

Discipline status	Selective
Number of credits	3
Total Hours	90
Lectures	0
Practical classes	30
Independent work	60
Type of final control	Credit

3. DESCRIPTION OF THE DISCIPLINE (ABSTRACT)

The discipline Modern Information Technologies is selective and refers to the professional training of a higher education applicant for the degree of Doctor of Philosophy in the specialty 221 "Dentistry". Weight is given to the in-depth study of the use of modern information technologies for information processing and presentation of the results of scientific research.

4. POLICY OF THE DISCIPLINE

4.1. ***List of regulatory documents:***

- Regulations on the organization of the educational process – https://cutt.ly/ArUqCMFh;
- Instruction on Assessment of Educational Activities of BSMU Applicants in the Context of the Implementation of the European Credit Transfer System for the Organization of the Educational Process – https://cutt.ly/yrUqVPvn;
- Regulations on the procedure for working out missed and uncredited classes – https://cutt.ly/jrUqBS36;
- Regulations on Appeal of the Results of the Final Control of Knowledge of Higher Education Applicants – https://cutt.ly/3rUqMAbV;
- Code of Academic Integrity – https://cutt.ly/FrUq1ljK;
- Regulations on the prevention of academic plagiarism – https://cutt.ly/MrUq6QAt;
- Regulations on the procedure and conditions for choosing elective disciplines by PhD students – https://cutt.ly/srUwo6Ci;
- Regulations on the Procedure for Recognizing Learning Outcomes Obtained through Non-Formal and/or Informal Education – https://cutt.ly/SrUwp1ie;
- Rules of conduct for PhD students – https://cutt.ly/ErUq72rZ;

- The rules of internal labor regulations are https://cutt.ly/UrUwiACe.

4.2. ***Policy on compliance with the principles of academic integrity of PhD students:***
- independent performance of educational tasks of current and final controls without the use of external sources of information;
- cheating during knowledge control is prohibited;
- independent performance of individual tasks and correct registration of references to sources of information in case of borrowing ideas, statements, information.

4.3. ***Policy on compliance with the principles and norms of ethics and deontology by PhD students:***
- actions in professional and educational situations from the standpoint of academic integrity and professional ethics and deontology;
- compliance with the rules of the internal regulations of the university and the rules of conduct of PhD students, to be tolerant, friendly and balanced in communication with PhD students and employees of departments, health care institutions, etc.;
- awareness of the significance of examples of human behavior in accordance with the norms of academic integrity and medical ethics.

4.4. ***Policy on attendance of classes by PhD students:***
- Attendance at all training sessions (lectures, practical (seminar) classes, final modular control) is mandatory for the purpose of current and final assessment of knowledge (except for cases for good reasons).

4.5. ***Deadline policy and working out missed or uncredited classes by higher education applicants:***
- Missed classes are processed according to the schedule of missed or uncredited classes and consultations.

5. PREREQUISITES AND POST-REQUISITES OF THE ACADEMIC DISCIPLINE (INTERDISCIPLINARY RELATIONS)

List of academic disciplines on which the study of the academic discipline is based	List of academic disciplines for which the foundation is laid as a result of studying the academic discipline
Medical and biological physics. Informational technologies in dentistry	
Social medicine, public health and basics of evidence-based medicine	

6. PURPOSE AND OBJECTIVES OF THE DISCIPLINE:

6.1.The purpose of studying the discipline is to acquire and deepen a complex of knowledge, skills, skills and other competencies sufficient to produce new ideas, solve complex problems in this discipline, master the methodology of scientific and pedagogical activities, as well as conduct your own scientific research that solves topical scientific problems, the results of which have scientific novelty, theoretical and practical significance.

6.2.The main tasks of studying the discipline are:
- mastering the terminology of modern information technologies;
- acquisition of skills to identify signs of plagiarism using modern information technologies;
- acquisition of skills in searching for scientific and professional information;
- acquisition of skills in information processing;
- acquisition of skills in working with programs for creating presentations.

7. COMPETENCIES, THE FORMATION OF WHICH IS FACILITATED BY THE ACADEMIC DISCIPLINE:

7.1.Integral competence:

Ability to produce new ideas, solve complex problems of dentistry and related interdisciplinary problems, apply the methodology of scientific and pedagogical activities, as well as conduct their own scientific research, the results of which are of scientific novelty, theoretical and practical significance.

7.2.General competencies:

GC02. Ability to search, process and analyze information from various sources.

7.3.Special competencies:

SC03. Ability to present and discuss the results of scientific research and innovative projects in the field of dentistry orally and in writing in the state language and one of the official languages of the European Union, to publish research results in leading international scientific publications.

SC 06. Ability to apply modern digital technologies, databases and other electronic resources, specialized software in scientific and educational activities.

SC 08. Ability to continuous self-development and self-improvement.

8. LEARNING OUTCOMES.

The discipline provides the formation of the following learning outcomes (LO):

LO03 The ability to present and discuss the results of scientific research and innovative projects in the field of dentistry orally and in writing in the state language and one of the official languages of the European Union, to publish research results in leading international scientific publications.

LO05. Apply modern tools and technologies for searching, processing and analyzing medical and biological information, in particular, statistical methods for analyzing data of large volume and/or complex structure, specialized databases and information systems.

LO06. Apply general principles and methods of research in the field of healthcare, as well as modern methods and tools, digital technologies and specialized software for conducting research in the field of dentistry.

As a result of studying the academic discipline, the student must:

8.1.Know:

- Leading information resources for information retrieval
- Modern information technologies
- Research ethics
- Legal basis of copyright
- Principles for the prevention of plagiarism, falsification and corruption
- Quality standards
- Quality assessment criteria
- Forms and methods of evaluation of the results of educational and scientific activity
- Content of the discipline (by specialization) in accordance with future professional activity
- Key concepts in the field of scientific research
- Priority areas for the development of science and medicine
- World Information Resources
- The essence of the research process
- Computer methods for detecting plagiarism.
- Services and programs for finding and determining plagiarism
- Principles of plagiarism prevention
- Basic principles of automation of accounting of medical services
- Basic principles of health information management
- Basic principles of the eHealth electronic health care system

8.2.Be able to:

- Use modern information technologies to search and process information

- Conduct information search
- Independently carry out educational and scientific activities
- Express your views
- Make your own decisions
- Use information technology to identify signs of plagiarism
- Monitor the educational and scientific process,
- Apply effective methods for assessing the cognitive sphere
- Develop proposals for its improvement
- Analyze the main theories and concepts in the field of study
- Interpret the results of research in the chosen scientific direction
- Conduct a critical analysis of modern scientific literature
- Adequately assess the achievements and limitations of research in the chosen scientific direction
- Use information technology to identify signs of plagiarism
- Apply the basic principles of automation of medical services accounting
- Apply the basic principles of health information management
- Apply the basic principles of the eHealth electronic health care system

8.3.Demonstrate:

- skills of using modern information technologies in conducting all stages of scientific research

9. INFORMATION VOLUME OF THE DISCIPLINE

MODULE 1. Modern information technologies

Content module 1. Information technologies of information search.

Specific objectives: to master the skills of using IT to search for scientific information

Topic 1. **Optimization of Internet search.**

Optimization of Internet search. Information retrieval systems.

International Bibliographic Databases of Scientific Information. Scientific electronic libraries.

Topic 2. **Computer methods for detecting plagiarism. Mailbox optimization**

Computer methods for detecting plagiarism. Services and programs for finding and detecting plagiarism. Mailbox optimization

Content module 2. Information Technologies of Information Presentation

Specific objectives: to master the skills of using IT to present research results

Topic 3. **Work with text documents.**

Work with text documents. Using styles. Building a table of contents, tables of references. Registration of the list of used sources. Tools for creating and editing PDF files.

Topic 4. **Presentation of the results of scientific research in the form of posters.**

Presentation of research results in the form of posters using PowerPoint, Canva, Google Slides application tools

Topic 5. **Presentation of the results of scientific research in the form of presentations.**

Presentation of research results in the form of presentations using PowerPoint, Canva, Google Slides, Prezi application tools

Topic 6. **Presentation of the results of scientific research in the form of videos.**

Video recording apps (Screenity, Canva, Prezi)

Topic 7. **Website creation.**

Website creation. Creating a business card website

Topic 8. **Create survey web forms.**

Create survey web forms. Processing of information obtained from survey forms.

Content module 3. Information Technologies of Information Processing

Specific objectives: to master the skills of using IT to process the results of scientific research

Topic 9. **Spreadsheets. Basics of calculation optimization.**

Spreadsheets. The use of spreadsheets to systematize the results of scientific research. Basics of optimization of calculations.

Topic 10. **Presentation of the results of scientific research in graphical form**

Business and scientific graphics. Presentation of the results of scientific research in graphic form.

10. STRUCTURE OF THE DISCIPLINE

Names of content modules and topics	Number of hours			
	Total	including		
		Classroom		Independent Work
		Lectures	Practical classes	
1	2	3	4	5
Module 1. Modern information technologies				
Content module 1. *Information technologies of information search.*				
Optimization of Internet search.	6		2	4
Computer methods for detecting plagiarism. Mailbox optimization	6		2	4
Content module 2. *Information technologies of information presentation.*				
Work with text documents.	10		4	6
Presentation of the results of scientific research in the form of posters.	8		2	6
Presentation of the results of scientific research in the form of presentations.	10		4	6
Presentation of the results of scientific research in the form of videos.	8		2	6
Website creation.	12		4	8
Create survey web forms.	12		4	8
Content module 3. *Information technologies of information processing.*				
Spreadsheets. Basics of optimization of calculations.	10		4	6
Presentation of the results of scientific research in graphical form	8		2	6
TOTAL HOURS	**90**		**30**	**60**

11. THEMATIC PLAN OF LECTURES

not provided

12. THEMATIC PLAN OF PRACTICAL CLASSES

№ salary	Topic name	Quantity hours
1	Optimization of Internet search. Google Scholar search engine. Summarizing information using Google Public Data.	2
2	Computer methods for detecting plagiarism. Google Mailbox Optimization. Google Chrome Extension – Google Translate	2
3	Work with text documents. Using styles. Building a table of contents, tables of references. Registration of the list of used sources. Tools for creating and editing PDF files.	4
4	Presentation of the results of scientific research in the form of posters. Online graphic editors Canva, Crello.	2

5	Presentation of the results of scientific research in the form of presentations. Online services for creating presentations Google Slides, Genial.ly, Prezi	4
6	Presentation of the results of scientific research in the form of videos. Online video recording services Loom, Screenity. Prezi. Posting videos on youtube	2
7	Website creation. Creating sites with Google Sites	4
8	Create survey web forms. Creating web forms with Google Forms Processing information obtained from survey forms.	4
9	Spreadsheets. Basics of optimization of calculations.	4
10	Business and scientific graphics. Presenting the results of scientific research in a graphical form using Data Studio	2
TOTAL		**30**

13. THEMATIC PLAN OF INDEPENDENT WORK

№ salary	Topic name	Quantity hours
1	Optimization of Internet search. Google Scholar search engine. Summarizing information using Google Public Data.	4
2	Computer methods for detecting plagiarism. Google Mailbox Optimization. Google Chrome Extension – Google Translate	4
3	Work with text documents. Using styles. Building a table of contents, tables of references. Registration of the list of used sources. Tools for creating and editing PDF files.	6
4	Presentation of the results of scientific research in the form of posters. Online graphic editors Canva, Crello.	6
5	Presentation of the results of scientific research in the form of presentations. Online services for creating presentations Google Slides, Prezi	6
6	Presentation of the results of scientific research in the form of videos. Online video recording services Loom, Screenity. Prezi. Posting videos on youtube	6
7	Website creation. Creating sites with Google Sites	8
8	Create survey web forms. Creating web forms with Google Forms Processing information obtained from survey forms.	8
9	Spreadsheets. Basics of optimization of calculations.	6
10	Business and scientific graphics. Presenting the results of scientific research in a graphical form using Data Studio	6
TOTAL		**60**

14. LIST OF INDIVIDUAL TASKS

not provided

15. TASKS FOR INDEPENDENT WORK

are determined by the teacher individually for each applicant in accordance with the topic and purpose of his scientific research

16.METHODS AND FORMS OF CONTROL

During the educational program, monitoring of academic performance is carried out on the basis of data from the information on attending practical classes, performing independent work. Upon successful completion of the course, the applicant receives a mark on the success of training and the number of credits in the individual curriculum.

The results of passing tests are evaluated on a two-point scale: "enrolled", "not enrolled".

The applicant receives a grade "enrolled" if he/she has completed all types of work provided for by the working curriculum in the discipline, attended all classes determined by the thematic plan in the relevant discipline (if there are gaps - worked them out in a timely manner), scored a total number of points in the study of the academic discipline not less than 120.

The applicant receives a grade "not enrolled" if there are unworked absences from classes and the number of points for the current control is less than the minimum.

The current educational activity of the applicant is evaluated on a 4-point scale.

17. LIST OF QUESTIONS FOR THE FINAL CONTROL

not provided

18. SCHEME OF ACCRUAL AND DISTRIBUTION OF POINTS

Module number, number of teaching hours/number of ECTS credits	Number of content modules, their numbers	Number of topics evaluated	Conversion to points of traditional grades					Minimum number of points
			Traditional assessments				Points for completing an individual task	
			«5»	**«4»**	**«3»**	**«2»**		
Module 1	3 №1-№3	10	20	16	12	0		120

The maximum number of points that a graduate student can score while studying the discipline is 200 points: 20·10=20

The minimum number of points that a graduate student can score while studying the discipline is 120 points: 12·10=120

Conversion of points from the discipline to the ECTS scale:

Score on a 200-point scale	**Rating on a four-point scale**
From 180 to 200 points	«5»
From 150 to 179 points	«4»
From 120 to 149 points	«3»
Less than 120 points	«2»

PhD students who study in the same course, in one specialty, based on the number of points scored in the discipline, are ranked according to the ECTS scale as follows:

ECTS assessment	**Statistical indicator**

"A"	Top 10% of graduate PhD students
"B"	Next 25% of PhD students
"C"	Next 30% of PhD students
«D»	Next 25% of PhD students
"E"	The last 10 % of graduate PhD students

Ranking with the assignment of grades "A", "B", "C", "D", "E" is carried out for PhD students who study in the same specialty and have successfully completed the study of the discipline.

Grades in the discipline "FX", "F" ("2") are given to PhD students who are not credited with at least one module in the discipline after completing its study.

The grade "FX" is given to PhD students who have scored the minimum number of points for the current educational activity, but have not received credit. This category of PhD students has the right to retake the test.

An "F" grade is given to PhD students who have attended all classroom classes in the module, but have not scored the minimum number of points for the current academic activity. This category of PhD students has the right to re-study the module.

The ECTS score to a traditional four-point scale is NOT converted because the ECTS scale and the four-point scale are independent.

19. RECOMMENDED READING

19.1 Basic (Basic)

1. Hutsul O.V., Ivanchuk M.A., Olar O.I., Fediv V.I. Medical Informatics. Part I. Fundamentals of Information Technologies in the Health Care System. computer in the activities of the future doctor: Study. Manual. – Chernivtsi, Bukovyna State Medical University, 2014. – 194 p. (in Russian).
2. Ivanchuk M.A., Olar O.I., Hutsul O.V., Fediv V.I. Medical Informatics. Biostatistics methods. Information resources of the health care system. – Chernivtsi. – 2015. – 200 p. (in Russian).
3. O.I. Olar, O.V. Hutsul, M.A. Ivanchuk, V.I. Fediv, T.V. Biryukova Medical Informatics. Part II. Processing and analysis of medical and biological data – Chernivtsi. – 2017. – 160 p. (in Russian).

19.2. Auxiliary

1. Rakuta V.M. Microsoft Office PowerPoint 2007 (2010) for pedagogical workers: a textbook. – Chernihiv: CHOIPPO. K.D. Ushinsky, 2013. – 43 p. (in Russian).
2. Radzishevska E. B., Vysotska O. V. Information Technologies in Medicine. E-health – Kharkiv: KhNMU, 2019. – 72 p. (in Russian).
3. Zlepko S.M., Tymchyk S.V., Fedosova I.V. et al. Modern Information Technologies in Science and Education – Vinnytsia: VNTU, 2018. – 161 p. (in Russian).
4. Fong B., Fong A., Li C. Telemedicine Technologies: Information Technologies in Medicine and Digital Health, 2nd Edition, Wiley, 2020, 320 p

19.3 Information Resources

1. Medical Publication Databases
    a. Google Scholar https://scholar.google.com.ua/
    b. PubMed http://www.ncbi.nlm.nih.gov/pubmed/
    c. Elseiver https://www.elsevier.com/solutions/scopus

d. Web of Science http://apps.webofknowledge.com/UA_GeneralSearch_input.do?product=UA&search_mode=GeneralSearch&SID=Z2CkZG3DcIlqeFFxMoF&preferencesSaved=
e. Wiley Publishing https://www.onlinelibrary.wiley.com/
f. Ukrainian Medical Journal https://www.umj.com.ua/
g. Cochrane Library https://www.cochranelibrary.com/

2. Plagiarism checker programs
    a. Copyscape http://www.copyscape.com/
    b. Plagiarism Checker https://smallseotools.com/plagiarism-checker/
    c. Plag https://www.plag.com.ua/
3. Creating posters and presentations
    a. Google Slides presentations https://www.google.com/slides
    b. Canva https://www.canva.com/
    c. Prezi https://prezi.com/
4. Working with documents and spreadsheets
    a. Working with pdf documents https://www.pdffiller.com/
    b. Google Docs https://docs.google.com/document
    c. Google Sheets https://docs.google.com/spreadsheets

20. COMPILERS OF THE SYLLABUS HANDBOOK

1. Maria IVANCHUK - Associate Professor of the Institution of Higher Education, Cand. Physical and Mathematical Sciences, Associate Professor.
2. Olena OLAR - Associate Professor of the Institution of Higher Education, Cand. Physical and Mathematical Sciences, Associate Professor.