MINISTRY OF HEALTH OF UKRAINE
BUKOVINIAN STATE MEDICAL UNIVERSUTY

«APPROVE»
Vice-Rector of higher educational establishment
on Scientific and Pedagogical Work
_____ Oksana GODOVANETS
«29» 08 2025

STUDENT GUIDE
(SYLLABUS)
of studying the discipline

«AI tools for scientific research»

Field of knowledge 22 Healthcare

Specialty 221 Dentistry

Educational degree__ third educational and scientific

Educational year 2

Form of study full-time (daytime, evening), part-time

Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases

Approved at a meeting of the department of internal medicine, clinical pharmacology and occupational diseases
«21» 08 2025 (Protocol № 1).

Head of the Department _____ **Oksana KHUKHLINA**
(signature)

Approved by the subject methodical commission
_____ «28» 08 2025 (Protocol № 7).

Chairman of the subject methodical
commission _____ **Viktor TASHCHUK**
(signature)

Chernivtsi – 2025

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

Department	– Internal medicine, clinical pharmacology and occupational diseases – Histology, Cytology and Embryology
Surname, name of scientific and pedagogical staff, scientific degree, academic status	– Tetiana ANTOFIICHUK - PhD, Assistant professor at the department of Internal medicine, clinical pharmacology and occupational diseases - Iryna POPOVA - PhD, Associate professor at the department of Histology, Cytology and Embryology
Web page of the department on the official website of the university	– Internal medicine, clinical pharmacology and occupational diseases https://www.bsmu.edu.ua/vnutrishnoyi-meditsini-klinichnoyi-farmakologiyi-ta-profesiynih-hvorob – Histology, Cytology and Embryology https://www.bsmu.edu.ua/gistologiyi-tsitologiyi-ta-embriologiyi/
Department website	– Internal medicine, clinical pharmacology and occupational diseases https://vmed.bsmu.edu.ua/ – Histology, Cytology and Embryology https://histology.bsmu.edu.ua/
E-mail	– Internal medicine, clinical pharmacology and occupational diseases therapy@bsmu.edu.ua – Histology, Cytology and Embryology histology@bsmu.edu.ua
Address	– Internal medicine, clinical pharmacology and occupational diseases Chernivtsi, Fastivska str., 2 – Histology, Cytology and Embryology Chernivtsi. Kobylianska str., 42
Contact phone	– Internal medicine, clinical pharmacology and occupational diseases +38 (03722) 6-92-21, – Histology, Cytology and Embryology +38 (0372) 52-53-42

2. GENERAL INFORMATION ABOUT THE DISCIPLINE

Status of the discipline	elective
Number of credits	3
Total amount of hours	90
Lectures	10
Practical lessons	30
Individual work	50
Type of final control	credit

3. DESCRIPTION OF THE DISCIPLINE (ABSTRACT)

The academic discipline 'AI Tools for Scientific Research' is an elective component of the educational and scientific programme of professional training and is studied by students during their second year of study.

The discipline aims to develop students' practical skills in using modern artificial intelligence tools to support scientific research in the fields of medicine and dentistry. The course covers the basics of working with analytical and generative AI, including literature search and critical analysis, medical data and image processing, automated statistics, and scientific text refinement. Particular attention is paid to ethical aspects, academic integrity requirements, and principles of responsible AI use, ensuring the safe, correct, and scientifically sound integration of these technologies into postgraduate research activities.

The subject of study is modern methods, technologies, and tools of artificial intelligence used to search, analyse, process, and interpret scientific information and medical data in the process of conducting research in the field of medicine and dentistry.

4. POLICY OF THE DISCIPLINE

4.1. List of normative documents:

- Regulations on the organization of the educational process – https://cutt.ly/ArUqCMFh;
- Instructions for assessing the educational activities of BSMU students in the implementation of the European credit transfer system of the educational process – https://cutt.ly/yrUqVPvn;
- Regulations on the procedure for reworking missed and uncredited classes – https://cutt.ly/jrUqBS36;
- Regulations on the appeal of the results of the final control of knowledge of higher education – https://cutt.ly/3rUqMAbV;
- Codex 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 students to choose elective courses – https://cutt.ly/srUwo6Ci;
- Regulations on the procedure for recognizing learning outcomes achieved through non-formal and/or informal education – https://cutt.ly/SrUwp1ie;
- Rules of conduct for students – https://cutt.ly/ErUq72rZ;
- Rules of internal labor regulations – https://cutt.ly/UrUwiACe.

4.2. Policy on adherence to the principles of academic integrity of students:

- independent performance of educational tasks of current and final controls without the use of external sources of information;
- cheating during control of knowledge is prohibited;
- independent performance of individual tasks and correct registration of references to sources of information in case of borrowing of ideas, statements, information.

4.3. Policy on adherence to the principles and norms of ethics and deontology by students:

- actions in professional and educational situations from the standpoint of academic integrity and professional ethics and deontology;
- compliance with the university's internal labor regulations and rules of conduct for students, be tolerant, friendly, and thoughtful in communicating with students and staff of departments, healthcare institutions, etc.
- awareness of the importance of examples of human behavior in accordance with the norms of academic integrity and medical ethics.

4.4. Attendance policy for 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 respectable reasons).

4.5. Deadline policy and completion of missed or uncredited classes by students:

- reworks of missed classes are held according to the schedule of missed or uncredited classes and consultations.

5. PRECISIONS AND POST-REQUIREMENTS OF THE DISCIPLINE (INTERDISCIPLINARY RELATIONS)

List of disciplines, on which the study of academic discipline is based	List of academic disciplines, for which the basis is laid as a result of studying the discipline
Fundamentals of patent law, intellectual property and implementation of scientific research results	
Modern information technologies	

6. PURPOSE AND TASKS OF THE DISCIPLINE:

6.1. **The purpose of studying** the discipline is to develop postgraduate students' ability to effectively apply modern artificial intelligence tools in scientific research in the field of medicine and dentistry. The course aims to teach students to search for, analyse and systematise scientific information using AI tools. An important component is the development of skills in working with medical data and images using automated methods of processing and evaluating results. The discipline is aimed at developing skills in the responsible and ethical use of analytical and generative AI in accordance with the requirements of academic integrity. The course also aims to ensure the ability to critically evaluate the performance of AI models, their limitations and possible risks. As a result, students should master the tools that will allow them to integrate AI into their own scientific projects and improve the quality of their research activities.

6.2. The main tasks of studying the discipline are:

- Familiarising postgraduate students with key artificial intelligence tools and technologies used in medical and dental research.
- Developing skills in searching for, analysing and systematising scientific information using AI platforms and automated systems.
- Developing skills in working with medical data and images, including their processing, visualisation and initial interpretation based on AI tools.
- Learning ethical principles, rules of academic integrity and data security requirements governing the use of analytical and generative AI in scientific activities.
- Developing the ability to critically evaluate the results of AI models and integrate them into one's own research projects, ensuring the scientific validity of the conclusions obtained.

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

7.1. Integral competence:

The ability to generate new ideas, solve complex problems in dentistry and related interdisciplinary issues, apply scientific and pedagogical methodologies, and conduct independent scientific research whose results are scientifically novel and have theoretical and practical significance.

7.2. General competencies:

GK01. Ability to solve complex problems based on a systematic scientific worldview and general cultural outlook, while adhering to professional ethics and academic integrity.

GK02. Ability to search for, process and analyse information from various sources.

GK04. Ability to work in an international context.

7.3. Professional (special) competencies:

SK01. Ability to conduct original research, achieve scientific results that create new knowledge in dentistry and related fields of medicine, and can be published in leading international scientific

journals.
SK02. Ability to initiate, develop and implement complex innovative projects in the field of dentistry and related interdisciplinary projects.
SK06. Ability to apply modern digital technologies, databases and other electronic resources, specialised software in scientific and educational activities.
SK07. Ability to critically analyse, evaluate and synthesise new and complex ideas in the field of dentistry and related interdisciplinary issues.
SK08. Ability for continuous self-development and self-improvement.

8. RESULTS OF STUDYING THE DISCIPLINE.

The academic discipline ensures the formation of the following program learning outcomes:
P01. Have conceptual and methodological knowledge in dentistry and related fields, as well as research skills sufficient to conduct scientific and applied research at the level of the latest global achievements in the relevant field, obtain new knowledge and/or implement innovations.
P03. Freely present and discuss with specialists and non-specialists the results of research and applied problems in dentistry in the national and foreign languages, publish research results in scientific publications in leading international scientific journals.
P04. Formulate and test hypotheses; use appropriate evidence to substantiate conclusions, in particular the results of theoretical analysis, experimental research, statistical data analysis, and available literature data.
P05. Apply modern tools and technologies for searching, processing and analysing medical and biological information, in particular statistical methods for analysing large volumes and/or complex structures of data, specialised databases and information systems.
P07. Develop and implement scientific and/or innovative medical projects that make it possible to rethink existing knowledge and create new comprehensive knowledge and/or professional practice and solve significant problems in the field of medicine.
As a result of studying the discipline student must:

8.1.Know:

- Basic concepts and principles of artificial intelligence, including analytical and generative models.
- Types of medical and scientific data used in dental research, and principles of their processing and anonymisation using AI.
- Capabilities, advantages, and limitations of AI tools in clinical and scientific research.
- Algorithms and methods for analysing medical images used in dental research.
- Principles and techniques for searching scientific literature using AI platforms and review automation systems.
- Ethical standards, academic integrity requirements, and rules for the safe use of AI, including the responsible use of generative models in science.
- Methods of automated statistics and analytics used to interpret research results.
- Criteria for assessing the reliability, accuracy and robustness of AI models, as well as the risks of their misuse.

8.2. Be able to:

- Use AI tools to effectively search, select, and systematise scientific literature in the field of medicine and dentistry.
- Work with medical data and images, performing basic processing, visualisation, and interpretation using AI tools.
- Use generative AI models to create scientific illustrations, diagrams, and educational materials in accordance with the principles of academic integrity.
- Perform automated statistical analysis and interpret the results obtained, taking into account the clinical context.
- Verify the reliability of AI models, evaluate sensitivity, specificity, and other quality indicators.

- Identify and avoid errors and risks associated with the use of analytical or generative AI in research.
- Integrate AI tools into your own scientific projects, improving the efficiency of data analysis and the quality of research results.
- Format and present research results, in particular using AI assistants to prepare presentations, images and text materials.

8.3. Demonstrate:

- Ability to use artificial intelligence tools responsibly and ethically in scientific and educational activities.
- Critical thinking about the results obtained with the help of AI and the ability to distinguish correct conclusions from potential errors or 'hallucinations' of models.
- Ability to justify the choice of specific AI tools for solving a particular research problem.
- Skills in working independently with scientific information, including analysis, synthesis, and drawing one's own conclusions.
- Willingness to integrate AI technologies into project and research activities, demonstrating adaptability to modern digital approaches.
- Ability to present research results using AI assistants to prepare text, graphic, and visual materials.
- Ability to work with scientific and medical data in accordance with confidentiality and academic integrity standards.
- Commitment to continuous professional development, particularly in the field of new AI technologies emerging in medicine and dentistry.

9. IINFORMATIONAL SCOPE OF THE DISCIPLINE

Description of each module of the discipline:

8.1. Specific objectives of the module (content modules).

Content module 1. **AI tools for scientific research.**

Specific objectives:

- Provide postgraduate students with practical skills in using artificial intelligence tools for literature search, data processing, image analysis and preparation of scientific texts in the field of dentistry;
- To develop an understanding of ethical principles, academic integrity requirements, and the responsible use of both analytical and generative AI in medical research;
- To develop postgraduate students' ability to critically evaluate the performance of AI models, verify their reliability, and integrate these tools into their own scientific projects.

8.2. Thematic structure of the module (content modules).

Topic 1. The concept of artificial intelligence and its use in dental research

The fundamentals of AI tools: algorithms, neural networks, LLM. The history of their emergence and application. Examples of AI use in dentistry: image analysis, clinical risk prediction, building a trajectory for clinical and scientific research.

Topic 2. Ethical principles of AI use in medicine and science.

Principles of responsible use of AI tools: transparency, absence of bias, authorship, academic integrity, legal regulation. High-risk situations: falsification, unlabelled deepfake data, manipulation of results.

Topic 3. Medical data: rules for collecting, storing, and encrypting information.

What are personal data, medical images, and 3D models? Basics of anonymisation, where to store data, how to prepare it for analysis.

Topic 4. AI tools for searching and analysing scientific literature

A simple overview of Elicit, ResearchRabbit, Semantic Scholar. How to quickly find articles, build a research map and create a literature review.

Topic 5. Generative AI in dentistry: text, images, 3D visualisations

How LLM and image generators can create illustrations, diagrams, teaching materials, and draft versions of scientific texts. Rules of academic integrity when using generative AI.

Topic 6. Using AI to write and edit scientific texts

Preparing structured text (introduction, methods, results), forming abstracts and reviews. How to avoid AI hallucinations and check the correctness of references.

Topic 7. AI for analysing dental images (recommended ready-made tools).

Overview of available services that automatically analyse X-rays and CT scans. Examples of tasks: caries detection, bone density assessment, structure measurement.

Topic 8. Automated statistics and data analysis using AI

How AI assistants help perform statistical analyses, build graphs, and interpret results. Examples of the most common statistical errors.

Topic 9. Cybersecurity and ethical regulation of AI tools in scientific research.

Topic 10. AI tools for a research project

Postgraduate students work on their own topic: they search for literature, prepare data, apply AI tools, and present a brief result (poster, presentation, mini-report).

10. STRUCTURE OF THE DISCIPLINE

Names of content modules and topics	Amount of hours				
	Total	including			
		Classroom		Independent students' work	Individual work
		Lections	Practicals		
1	2	3	4	5	6
Module 1					
Content module 1. AI tools for scientific research.					
Topic 1. The concept of artificial intelligence and its use in dental research	9	-	3	6	-
Topic 2. Ethical principles of AI use in medicine and science	9	-	3	6	-
Topic 3. Medical data: rules for collecting, storing, and encrypting information	9	-	3	6	-
Topic 4. AI tools for searching and analysing scientific literature	9	-	3	6	-
Topic 5. Generative AI in dentistry: text, images, 3D visualisations	9	-	3	6	-
Topic 6. Using AI to write and edit scientific texts	9	-	3	6	-
Topic 7. AI for analysing dental images (recommended ready-made tools).	9	-	3	6	-
Topic 8. Automated statistics and data analysis using AI	9	-	3	6	-
Topic 9. Cybersecurity and ethical regulation of AI tools in scientific research.	9	-	3	6	-
Topic 10. AI tools for scientific research projects	9	-	3	6	-

TOTAL HOURS	90			60	-

11. THEMATIC PLAN OF LECTURES

Lectures are not included in the work programme.

12. THEMATIC PLAN OF PRACTICAL (SEMINAR) CLASSES

№	Name f topic	Amount of hours
1	The concept of artificial intelligence and its use in dental research	3
2	Ethical principles of AI use in medicine and science	3
3	Medical data: rules for collecting, storing, and encrypting information	3
4	AI tools for searching and analysing scientific literature	3
5	Generative AI in dentistry: text, images, 3D visualisations	3
6	The use of AI for writing and editing scientific texts	3
7	AI for analysing dental images (recommended ready-made tools).	3
8	Automated statistics and data analysis using AI	3
9	Cybersecurity and ethical regulation of AI tools in scientific research.	3
10	AI tools for scientific research projects	3
Total		**30**

13. THEMATIC PLAN OF INDIVIDUAL WORK

№	Name f topic	Amount of hours
1	The concept of artificial intelligence and its use in dental research	6
2	Ethical principles of AI use in medicine and science	6
3	Medical data: rules for collecting, storing, and encrypting information	6
4	AI tools for searching and analysing scientific literature	6
5	Generative AI in dentistry: text, images, 3D visualisations	6
6	The use of AI for writing and editing scientific texts	6
7	AI for analysing dental images (recommended ready-made tools).	6
8	Automated statistics and data analysis using AI	6
9	Cybersecurity and ethical regulation of AI tools in scientific research.	6
10	AI tools for scientific research projects	6
Total		**60**

14. LIST OF INDIVIDUAL TASKS

Individual assignments are not included in the work programme.

15. TASKS FOR INDEPENDENT WORK

Independent works are not included in the work programme.

16. METHODS AND FORMS OF CONTROL (including criteria for assessing learning outcomes)

16.1. Form, procedure, methodology, and criteria for assessing current learning activities. Throughout the course, all types of activities are subject to assessment, both ongoing (during each class) and final (during tests).

Final assessment is a diagnosis of the assimilation of the module material (credit). The course ends with a test.

Initial assessment of students' knowledge is carried out during practical classes and includes testing of theoretical and practical material using a baseline knowledge test.

16.2. Form, procedure, methodology, and criteria for assessing individual independent work.
Independent works are not included in the work programme.

16.3. Conditions for admission to the final assessment.
Ongoing assessment of applicants' knowledge is carried out during practical classes and includes testing of theoretical knowledge and assessment of practical skills, as provided for in the methodological guidelines for classes on relevant topics. Applicants' knowledge is tested through discussion of class questions, participation in role-playing games based on a scenario, project planning, and knowledge level testing.

The final assessment of applicants' knowledge of the discipline is carried out in the form of a test. A test is a form of final assessment that consists of evaluating the applicant's mastery of the educational material in a particular discipline solely on the basis of the results of their performance of certain types of work in practical, seminar or laboratory classes.

The number of topics for practical (seminar) classes in the academic discipline is determined in the working curriculum and does not provide for a separate class for the test.

16.4. Form, procedure, methodology, and criteria for assessment during the final assessment.
The module grade is determined as the sum of the grades for current academic activity (in points) awarded during practical classes, in accordance with the lists specified in the discipline programme. The grade for the academic discipline is determined as the sum of the grades for current academic activity (in points) awarded in each class on the relevant topic and the number of points for completing individual assignments.

The maximum number of points for studying a discipline for current academic activity and completing individual assignments, which is awarded to applicants upon completion of a module (credit) is 200 points.

17. LIST OF TASKS TO THE FINAL CONTROL

17.1. List of theoretical questions for the final module control.

1. What is artificial intelligence and what are its main types?
2. How is AI used to diagnose dental diseases?
3. What are the advantages of using AI in clinical dental research?
4. Give examples of the successful application of AI in dentistry.
5. What are the limitations of implementing AI in dental practice?
6. What are the main ethical principles to consider when using AI in medicine?
7. How can informed patient consent be ensured when using AI?
8. Why is it important to avoid algorithmic bias in medical research?
9. What are the risks associated with autonomous AI decisions in treatment?
10. How is liability for AI errors regulated?
11. What are the requirements for medical data collection according to international standards?
12. What is data encryption and how does it protect patient information?
13. What technologies are used for the secure storage of medical data?
14. How can AI help detect data security breaches?
15. What are the possible legal consequences of a medical information leak?
16. What AI platforms are used to analyse scientific publications?
17. How does AI help identify relevant sources for research?
18. What are the advantages of automated literature analysis over manual analysis?
19. How can AI identify scientific trends or gaps in research?
20. What are the limitations of using AI for literature analysis?
21. What is generative AI and how does it work?
22. How can AI create 3D models of teeth or jaws?
23. What ethical issues arise when generating medical images?
24. How is generative AI used to create educational materials?
25. What are the advantages of text generation for dental reports?
26. What AI tools help in writing scientific articles?

27. How can AI improve the structure and logic of scientific text?
28. What are the risks associated with the automatic creation of scientific content?
29. How can the accuracy of AI-generated facts be verified?
30. Which stages of text editing can AI automate?
31. What ready-made AI tools are available for analysing X-ray images?
32. How does AI identify pathologies in dental images?
33. What algorithms are used for image classification?
34. How can the accuracy of AI in visual diagnostics be assessed?
35. What are the limitations of AI tools when working with medical images?
36. How does AI help in the statistical analysis of medical research?
37. What types of data are best suited for AI analysis?
38. How can AI detect correlations between clinical indicators?
39. What tools are used to visualise the results of the analysis?
40. How can the reliability of statistical conclusions obtained by AI be verified?
41. What cybersecurity threats are associated with the use of AI?
42. How can scientific data be protected from unauthorised access?
43. What international ethical standards regulate AI in science?
44. How can AI independently detect cyber threats?
45. What control mechanisms should be implemented when working with AI?
46. What stages of scientific research can be automated using AI?
47. How to choose the right AI tool for data analysis?
48. Which AI platforms support collaborative work on projects?
49. How can the effectiveness of AI use in the research process be evaluated?
50. What skills does a researcher need to work with AI tools?

17.2. List of practical tasks and assignments for the final module control.

18. SCORE CALCULATION AND DISTRIBUTION SCHEME

When assessing the mastery of each topic, applicants are graded on a 4-point scale (traditional – 2, 3, 4, 5) and on a 200-point scale using accepted and approved assessment criteria for the relevant academic discipline. All types of work provided for in the methodological development for studying the topic are taken into account. Grades given on the traditional scale are converted into points depending on the number of topics. The weight of each topic within a single module in points is the same. The forms of assessment of current academic activity are standardised and include monitoring of theoretical and practical training. The final score for current activity is recognised as the arithmetic sum of the points for each class and for individual work. The maximum number of points that a student can earn for current activities while studying a discipline is calculated by multiplying the number of points corresponding to a grade of '5' by the number of topics, adding points for the student's individual assignment, but not exceeding 200 points **(10x18+20=200).**

Number of module number of study hours / number of credits ECTS	Number of content modules, their numbers	Number of practical classes	Conversion into point of the traditional scale					Minimum score *
			Traditional scale				Scores for individual task	
			«5»	«4»	«3»	«2»		
Module 1 90/3	1	10	18	15	11	0	120	200

The minimum number of points that a candidate can earn while studying the module is calculated by adding up the number of points corresponding to a 'satisfactory' grade for each class: **120 = (11 x 10) + 10.**

The results of the tests are assessed on a two-point scale: 'pass' or "fail". A student receives a 'pass' grade if they have completed all the work required by the course syllabus, attended all the classes specified in the thematic plan for the relevant discipline (if there are any absences, they have been made up in a timely manner), and has earned a total of at least 120 points in the study of the academic discipline. The applicant receives a 'fail' grade if they have unexcused absences from classes (practical, seminars and lectures) and the number of points for current control is less than the minimum.

19. RECOMMENDED LITERATURE

19.1 Basic

1. Shevchenko, V. G., Muravyov, P. T., Kravets, K. V. (2025). Ethics of using artificial intelligence in higher medical education. Medical Education, (1), 94-98.
2. Petrukha, N. M., Vesova, O. P., Kaminsky, V. V. (2025). The use of artificial intelligence to personalise learning trajectories in medical education in Ukraine. Pedagogical Academy: scientific notes, (24).
3. Carrillo-Perez, F., Pecho, O. E., Morales, J. C., Paravina, R. D., Della Bona, A., Ghinea, R., ... & Herrera, L. J. (2022). Applications of artificial intelligence in dentistry: A comprehensive review. Journal of Esthetic and Restorative Dentistry, 34(1), 259-280.
4. Hung K, Yeung AWK, Tanaka R, Bornstein MM. Current Applications, Opportunities, and Limitations of AI for 3D Imaging in Dental Research and Practice. Int J Environ Res Public Health. 2020 Jun 19;17(12):4424. doi: 10.3390/ijerph17124424. PMID: 32575560; PMCID: PMC7345758.
5. Meghil, M. M., Rajpurohit, P., Awad, M. E., McKee, J., Shahoumi, L. A., & Ghaly, M. (2022). Artificial intelligence in dentistry. Dentistry Review, 2(1), 100009.
6. Mazur, I. P., Antonyshyn, I. V., Hasiuk, N. V., & Radchuk, V. B. (2025). The future is already here: how is artificial intelligence changing the way we think about dentistry?. Oral and General Health, 6(2), 70-77.
7. Ma J, Schneider L, Lapuschkin S, Achtibat R, Duchrau M, Krois J, Schwendicke F, Samek W. Towards Trustworthy AI in Dentistry. J Dent Res. 2022 Oct;101(11):1263-1268. doi: 10.1177/00220345221106086. Epub 2022 Jun 23. PMID: 35746889; PMCID: PMC9516595.
8. Shaikh, K., Bekal, S. V., Marei, H. F. A., Elsayed, W. S. M., Surdilovic, D., & Jawad, L. A. (2023). Artificial intelligence in dentistry. Berlin, Germany: Springer.
9. Schwendicke F, Samek W, Krois J. Artificial Intelligence in Dentistry: Chances and Challenges. J Dent Res. 2020 Jul;99(7):769-774. doi: 10.1177/0022034520915714. Epub 2020 Apr 21. PMID: 32315260; PMCID: PMC7309354.
10. Ko, C. C., Shen, D., & Wang, L. (Eds.). (2021). Machine learning in dentistry. Springer International Publishing.

19.2. Auxillary

1. Agrawal, P., Nikhade, P., & Nikhade, P. P. (2022). Artificial intelligence in dentistry: past, present, and future. Cureus, 14(7).
2. Akkaya, N., Ünsal, G., & Orhan, K. (2024). Understanding of AI in Dental Field with Technical Aspects. In Artificial Intelligence in Dentistry (pp. 9-31). Cham: Springer International Publishing
3. Deshmukh, S. V. (2018). Artificial intelligence in dentistry. Journal of the International Clinical Dental Research Organization, 10(2), 47-48.
4. Kamalanand, K., Thayumanavan, B., & Jawahar, P. M. (Eds.). (2018). Computational Techniques for Dental Image Analysis. IGI Global.
5. Makhubele, K. C. (2024). Artificial intelligence in dentistry: bridging knowledge and practice. South African Dental Journal, 79(9), 468-469.

6. Negi S, Mathur A, Tripathy S, Mehta V, Snigdha NT, Adil AH, Karobari MI. Artificial Intelligence in Dental Caries Diagnosis and Detection: An Umbrella Review. Clin Exp Dent Res. 2024 Aug;10(4):e70004. doi: 10.1002/cre2.70004. PMID: 39206581; PMCID: PMC11358700.

7. Setzer FC, Li J, Khan AA. The Use of Artificial Intelligence in Endodontics. J Dent Res. 2024 Aug;103(9):853-862. doi: 10.1177/00220345241255593. Epub 2024 May 31. PMID: 38822561; PMCID: PMC11378448.

19.3 Information resources

1. https://www.vevidental.com/
2. https://www.hellopearl.com/
3. https://www.overjet.com/
4. https://diagnocat.com/uk

20. COMPILERS OF THE STUDENT GUIDE (SYLLABUS)

- Tetiana ANTOFIICHUK – PhD, Assistant professor at the department of Internal medicine, clinical pharmacology and occupational diseases