



Pre-diploma practice

Working program of the academic discipline (Syllabus)

Requisites for basic discipline

Level of higher education	<i>First (bachelor's)</i>
Branch of knowledge	<i>16 Chemical and Bioengineering</i>
Specialty	<i>163 Biomedical Engineering</i>
Educational program	<i>Medical Engineering</i>
Discipline status	<i>Mandatory discipline</i>
Form of study	<i>full-time/mixed/distance</i>
Year of preparation, semester	<i>4th course, spring semester</i>
The scope of discipline	<i>6 ECTS/180 hours</i>
Semester control / Control measures	<i>Test</i>
Lessons schedule	<i>According to the schedule on the site http://rozklad.kpi.ua/</i>
Language of instruction	<i>English</i>
Information about course leader / teachers	<i>Senior lecturer Ovcharenko Anna Romanivna, ovcharenko.ganna@iil.kpi.ua Telegram - https://t.me/Anna_Ov</i>
Teacher profile	<i>http://bmi.fbmi.kpi.ua/department/staff-department/ http://intellect.bmi.fbmi.kpi.ua/profile/ogr</i>
Course placement	<i>Sikorsky Platform – course «Pre-diploma practice»</i>

Curriculum of the discipline

1. Description of the discipline, its purpose, subject of study and learning outcomes

During the practice, students gain new knowledge, skills and abilities, mainly when performing specific practical tasks, so the work of students in full-time positions (paid and unpaid) is the most appropriate in comparison with the observation practice.

Prior to the start of the practice, an agreement is signed between the department and the company where the students will take the practice.

Quite often during the practice students are involved by the administration to provide assistance to the practice base. The nature of such practice must strictly comply with the profile of training and the duration should not interfere with the implementation of educational tasks.

Pre-diploma practice begins with acquaintance of students with tasks, the form of carrying out, the schedule of a working day, rules of filling in the diaries.

Students in practice must strictly adhere to the rules of protection and fire safety adopted on the basis of practice, with mandatory training (introductory and at each specific place of practice).

The purpose of the discipline: preparation of certification work for successful completion of training in the specialty.

Learning is carried out on the basis of a modern strategy of interaction between a teacher and a student on line in order for students to master the material and develop their practical skills. During training the following are applied:

- strategies of active and collective learning;*
- personality-oriented development technologies based on active forms and teaching methods (team-based learning), think-pair-share, brainstorming method, case study method, business games, discussion, etc.);*

- heuristic methods (methods of creating ideas, methods of solving creative problems, methods activation of creative thinking);

- method of problem-oriented learning.

For more effective communication in order to understand the structure of the discipline and Assimilation of the material is used by the platforms: <https://do.ipk.kpi.ua> and <https://classroom.google.com/> through which:

- simplifies the placement and exchange of educational material;

- provides feedback to students regarding learning tasks and the content of the discipline;

- students' learning tasks are evaluated;

- the account of performance by students of the plan of educational discipline, the schedule of performance is conducted learning tasks and student assessment.

General competencies (OPP was put into effect by the Rector's Order NON/ 89/2021 of 19.04.2021):

GC 1 Ability to apply knowledge in practical situations.

GC 2 Knowledge and understanding of the subject area and understanding of professional activity.

GC 3 Ability to communicate in the state language both orally and in writing.

GC 4 Skills in the use of information and communication technologies.

GC 5 Ability to perform research at the appropriate level.

GC 6 Ability to search, process and analyze information from various sources.

GC 7 Ability to generate new ideas (creativity).

GC 8 Ability to make well-grounded decisions.

GC 9 Ability to communicate with representatives of other professional groups of different levels (with experts from other fields of knowledge / types of economic activity).

GC 10 Safe activities skills.

GC 11 Ability to evaluate and ensure the quality of work performed.

GC 12 The ability to realize their rights and responsibilities as a member of society, to appreciate the values of civil (free democratic) society and the need for its sustainable development, the rule of law, rights and freedoms of human and of Ukraine's citizen.

Special (professional) competencies (OPP was put into effect by the Rector's Order NON/ 89/2021 of 19.04.2021):

PC 1 Ability to use engineering software packages for research, analysis, processing and presentation of results, as well as for automated design of medical devices and systems.

PC 2 Ability to provide engineering expertise in the process of planning, development, evaluation and specification of medical equipment.

PC 3 Ability to study and apply new methods and tools for analysis, modeling, design and optimization of medical devices and systems.

PC 4 Ability to provide technical and functional characteristics of systems and tools used in medicine and biology (in prevention, diagnosis, treatment and rehabilitation).

PC 5 Ability to apply physical, chemical, biological and mathematical methods in the analysis, modeling of the functioning of living organisms and biotechnical systems.

PC 6 Ability to effectively use tools and methods for analysis, design, calculation and testing in the development of biomedical products and services.

PC 7 Ability to plan, design, develop, install, operate, exploit, maintain, control and coordinate the repair of devices, equipment and systems for prevention, diagnosis, treatment and rehabilitation used in hospitals and research institutes.

PC 8 Ability to perfect research and observations on the interaction of biological, natural and artificial systems (prostheses, artificial organs, etc.).

PC 9 Ability to identify, formulate and solve engineering problems related to the interaction between living and non-living systems.

PC 10 Ability to apply the principles of construction of modern automated control systems for the production of medical devices, their technical, algorithmic, informational and software support for

solving professional problems.

PC 11 *Ability to understand the technical and functional characteristics of systems, methods and procedures used in prevention, diagnosis and therapy.*

PC 12 *Ability to develop, plan and apply mathematical methods in the analysis, modeling of the functioning of living organisms, systems and processes in biology and medicine.*

PC 13 *Ability to provide and monitor compliance with safety and biomedical ethics when working with medical equipment.*

PC 14 *Ability to perfect experiments according to specified technical and medical methods, perform computer processing, analysis and synthesis of the results.*

The program learning outcomes after studying the discipline "Radiation safety" are (OPP was put into effect by the Rector's Order NON/ 89/2021 of 19.04.2021):

PLO 1 *Understanding of fundamental-applied, medical-physical and bioengineering bases of technologies and equipment for research of processes of a human body*

PLO 2 *Possession of engineering methods for calculation of elements of devices and systems of medical use and a choice of classical and newest constructional materials.*

PLO 3 *Knowledge of design tools for devices, appliances and systems of medical and biological purposes.*

PLO 4 *Knowledge of methods of designing digital and microprocessor systems for medical purposes .*

PLO 5 *Knowledge of research methods and techniques used in the design of medical equipment .*

PLO 6 *Knowledge of object research methods, analysis and processing of experimental data.*

PLO 7 *Understanding of scientific and technical principles that underlie the latest advances in biomedical engineering.*

PLO 8 *Knowledge of a foreign language to the extent sufficient for general and professional communication .*

PLO 9 *Application of principles of automatic control systems construction and properties of their elements.*

PLO 10 *Knowledge of the basic physical and physicochemical patterns of biological objects functioning.*

PLO 11 *Knowledge of the basic conditions of operation of diagnostic and therapeutic systems, medical complexes and systems.*

PLO 12 *Operation and maintenance of medical equipment in accordance with the rules established by technical documentation and regulations.*

PLO 13 *Use of methods and means of systematization and processing of experimental information.*

PLO 14 *Possession of tools for experimental research (medical devices, biomaterials for medical purposes).*

PLO 15 *Use of technical systems of automated designing taking into account features of their components.*

PLO 16 *Application of modern programming technologies and tools that support their use*

PLO 17 *Knowledge of general information about the human body and its functions from the standpoint of a systems approach and their use in biomedical engineering .*

PLO 18 *Using practical methods of organization to solve engineering and scientific practical problems of different complexity levels.*

PLO 19 *Knowledge of technical documentation governing the commissioning, use and repair of medical equipment.*

PLO 20 *Using of methods of signal theory and methods of research of signals and images in biomedical engineering.*

PLO 21 *Knowledge of the basic methods and tools used to quantify the functioning of physiological systems .*

- PLO 22** Use methods of statistical processing, modeling and simulation of processes and systems of physical and biological nature in biomedical engineering.
- PLO 23** Knowledge of universal principles of complex biological systems structure, including the human body .
- PLO 24** Apply knowledge of the basics of mathematics, physics and biophysics, bioengineering, chemistry, engineering graphics, mechanics, resistance and strength of materials, properties of gases and liquids, electronics, computer science, obtaining and analyzing signals and images, automatic control, systems analysis and decision making methods at the level required to solve the problems of biomedical engineering.
- PLO 25** Formulation of logical conclusions and substantiation of recommendations for evaluation, operation and implementation of biotechnical, medical-technical and bioengineering means and methods
- PLO 26** Management of complex actions or projects that require engineering decisions in unpredictable conditions.
- PLO 27** Application of the provisions of normative technical documents regulating the procedure for product certification, production certification.
- PLO 28** Use of databases, mathematical and software for data processing and computer modeling of biotechnical systems.
- PLO 29** Professional communication with healthcare professionals in the state and foreign languages (English or one of the other official EU languages) and understanding of their requirements for biomedical products and services
- PLO 30** Engineering support, service and maintenance in the operation of laboratory analytical equipment, medical diagnostic and therapeutic complexes and systems, as well as the preparation of standard documentation for the types of work in accordance with the Technical Regulations for medical devices.
- PLO 31** Understanding of theoretical and practical approaches to the creation and management of medical equipment and medical technic.
- PLO 32** Understanding of theoretical and practical approaches to creation and application of artificial biological and biotechnical objects and materials of medical appointment.
- PLO 33** Planning, organization and control of medical-technical and bioengineering systems and processes.
- PLO 34** Control of quality and operating conditions of medical equipment and materials for medical purposes, artificial organs and prostheses.
- PLO 35** Ability to provide advice on the choice of equipment to support diagnosis and treatment.
- PLO 36** Analysis of signals transmitted from organs to devices, and receipt and processing of diagnostic information.
- PLO 37** Ability to analyze the level of compliance with modern world standards, as well as evaluate solutions and set tasks for the development of automated control systems, taking into account the capabilities of modern hardware and software for automation of medical equipment.
- PLO 38** Ability to set tasks for the development of automated control systems taking into account the capabilities of modern hardware and software for automation of medical equipment.
- PLO 39** Recommendation and technical support of appropriate medical equipment and biomaterials for equipping medical institutions and support the main stages of the technological process of diagnosis, prevention and treatment.
- PLO 40** Use of computer-aided design systems for development of technological and hardware scheme of medical devices and systems.
- PLO 41** Apply knowledge of chemistry and bioengineering for the creation, synthesis and application of artificial biotechnical and biological objects.
- PLO 42** Development and implementation of modern diagnostic and therapeutic methods related to the use of biotechnology, computer and nanotechnology.
- PLO 43** The use of methods and means of quantitative evaluation of the functioning of physiological systems in practical engineering..

PLO 44 Possession of modern methods of testing the experimental integrity and performance of biotechnical systems and determining their characteristics.

PLO 45 Improving the technical elements of medical devices and systems and medical products in the process of professional activity.

2. Prerequisites and postrequisites of the discipline (place in the structural and logical scheme of education according to the relevant educational program)

The discipline is interdisciplinary. It is the foundation for the preparation of certification work for the successful completion of training in the specialty.

Required skills

1. Successful implementation of an individual training plan.

3. The content of the discipline

The main sections and topics considered in the process of studying the course:

According to the individual calendar plan for the preparation of certification work and working program.

4. Training materials and resources

Basic literature

1. Стандарт вищої освіти зі спеціальності 163 Біомедична інженерія / Мін-ство освіти і науки України, НТУУ «КПІ». Київ, 2020. – 18 с. // <http://bmi.fbmi.kpi.ua/wp-content/uploads/2020/09/163-biomedichnainzheneriya-bakalavr.pdf>

2. Освітньо-професійні програми першого (бакалаврського) рівня вищої освіти: Медична інженерія та Регенеративна та біофармацевтична інженерія / Мін-ство освіти і науки України, НТУУ «КПІ». Київ, 2021. –19 с. // <https://osvita.kpi.ua/163>

3. ПОЛОЖЕННЯ ПРО ОРГАНІЗАЦІЮ ОСВІТНЬОГО ПРОЦЕСУ В КПІ ІМ. ІГОРЯ СІКОРСЬКОГО / Мін-ство освіти і науки України, НТУУ «КПІ». Київ, 2020. – 17с. // https://document.kpi.ua/files/2020_7-124.pdf

4. ПОЛОЖЕННЯ ПРО ПОРЯДОК ПРОВЕДЕННЯ ПРАКТИКИ ЗДОБУВАЧІВ ВИЩОЇ ОСВІТИ КПІ ІМ. ІГОРЯ СІКОРСЬКОГО / Мін-ство освіти і науки України, НТУУ «КПІ». Київ, 2020. – 16 с. https://document.kpi.ua/files/2020_7-172.pdf

Additional literature

5. Палеха Ю. Основи науково-дослідної роботи / Ю. Палеха, Н. Леміш. – Київ: Ліра-К, 2013. – 336 с. – ISBN 978-966-2609-31-8

Information resources

6. Sikorsky Platform – <https://do.ipk.kpi.ua/course/view.php?id=3115>

7. Information service Igor Sikorsky Kyiv Polytechnic Institute <https://document.kpi.ua/>

8. Faculty of biomedical engineering <https://fbmi.kpi.ua>

The list of information resources lists the sources of their receipt.

Educational content

5. Methods of mastering the discipline (educational component)

№ s/n	Subject	Program learning outcomes	The main tasks	
			Control measure	Deadline
1.	Arrival of the student at the practice, registration and reception of passes.		Individual consultation	Week 1

№ s/n	Subject	Program learning outcomes	The main tasks	
			Control measure	Deadline
2.	<i>Training on safety and labor protection, etc.</i>		<i>Individual consultation</i>	<i>Week 1</i>
3.	<i>Individual organizational actions: - acquaintance with the purpose of practice, knowledge, skills and abilities of the student for the period of practice; - with the content and technology of the practice; - with the peculiarities of finding, collecting and selecting the necessary scientific and practical sources and literature; - requirements for the report on the student's implementation of the practice program, individual task.</i>	<i>PLO 1-45</i>	<i>Individual consultation</i>	<i>Week 1</i>
4.	<i>Acquaintance with the objects of practice</i>	<i>PLO 1-45</i>	<i>Individual consultation</i>	<i>Week 1</i>
5.	<i>Acquaintance with the features of practice: - diagnostic and treatment research medical institutions, etc.; - public and private institutions and establishments</i>	<i>PLO 1-45</i>	<i>Individual consultation</i>	<i>Week 1</i>
6.	<i>Guide on the enterprise, acquaintance with a place of work.</i>		<i>Individual consultation</i>	<i>Week 1</i>
7.	<i>Planning of the practice report, introduction (on a subject of work)</i>		<i>Individual consultation</i>	<i>Day 4 -6 Week 1</i>
8.	<i>Acquaintance on the basis of practice with the list of literature: normative materials, descriptions, visual aids, etc.</i>		<i>Individual consultation</i>	<i>Week 1 Week 2</i>
9.	<i>Carrying out the program of practice and individual task (with weekly check of execution of the calendar plan).</i>	<i>PLO 1-45</i>	<i>Individual consultation</i>	<i>During practice</i>
10	<i>Filling in the diary for week 1</i>		<i>Individual consultation</i>	<i>Week 1</i>
11	<i>Filling in the diary for week 2</i>		<i>Individual consultation</i>	<i>Week 2</i>
12	<i>Filling in the diary for week 3</i>		<i>Individual consultation</i>	<i>Week 3</i>
13	<i>Filling in the diary for week 4</i>		<i>Individual consultation</i>	<i>Week 4</i>
14	<i>Filling in the diary for week 5</i>		<i>Individual consultation</i>	<i>Week 5</i>
15	<i>Preparation of the practice report</i>	<i>PLO 1-45</i>	<i>Individual consultation</i>	<i>Week 5</i>

№ s/n	Subject	Program learning outcomes	The main tasks	
			Control measure	Deadline
16	Practice reference from the chief of the practice.		Individual consultation	Week 5
17	Preparation of a defense presentation of practice	PLO 1-45	Individual consultation	Week 5
18	Providing in e-form an annotation on practice in 3 languages in pdf. format on the website of the department		Individual consultation	Week 5
19	Providing documents on practice at the department (report, diary, abstract, statement on the topic)		Individual consultation	Week 5
20	Defense of pre-diploma practice by a student in front of the commission appointed by the head of the department (subject or cycle commission)	PLO 1-45	Test	Week 6

Responsibility for the organization, conduct and control of pre-diploma practice of students rests with the head of the graduating department of biomedical engineering. The direct management of the pre-diploma practice of each student is entrusted to the teacher (thesis supervisor) and the head of the practice from the department, who are appointed and approved at the meeting of the department by the head of the department. Assignment of student supervisors of diploma theses (projects) and an approximate topic of the task for practice is approved at a meeting of the department in August of this year. By September 1 of the current year, the thesis supervisor must approve an individual task and a calendar plan for the individual task of the student (s) assigned to him / her.

The person responsible for practice from the department monitors weekly, with the help of thesis supervisors, the implementation of individual calendar plans by students and reports it to the head of the department.

At least once a month (at a meeting of the department) supervisors of the thesis and the person responsible for practice from the department report on the implementation of students in practice of their individual tasks.

In case the student does not fulfill the timely approved calendar plan (without a proved reason) at the meeting of the department a decision may be made not to admit the student to the defense of the practice and his further expulsion from the university.

Distance learning platform:

For more effective communication in order to understand the structure of the discipline "Pre-diploma practice" and master the material used e-mail, telegram channel, distance learning platform "Sikorsky" based on the Moodle KPI-Telecom system and service for online meetings Zoom, through which :

- increases the efficiency of communication with students, provides convenient feedback;
- simplifies the placement, access and exchange of educational material;
- students' learning tasks are evaluated;
- student activity is analyzed.

6. Independent student work

The following types of independent work are scheduled: on the topic of attestation work, prepared and carried out report and accompanying documents, preparation for the test. A total of 180 hours are scheduled for the independent work.

One of the main types of semester control during the mastering of the discipline "Pre-diploma practice" is the implementation of the report. The report is performed in accordance with the requirements, within the period specified by the teacher.

It aims to master the ability to identify current issues; additional, in-depth study and practical awareness of certain sections of the curriculum; development of skills of independent work with scientific literature.

The main purpose of the report is to solve a practical problem using theoretical material and practical skills acquired during training in the bachelor's program in biomedical engineering.

The student can write a report only on a topic agreed with the teacher.

Approximate subject of control homework:

1. According to the topic of the attestation work.

Detailed requirements for the report to be prepared, carried out long with the supporting documentation are given in the methodical guidelines for the discipline.

The title page should have the following content: the name of the university; name of the faculty; name of department; name of specialty, name of educational-professional program, registration number, name of academic discipline; topic of the report; surname and name of the student, course, number of the academic group, year.

The title page is followed by a detailed plan (content) of the report, which should highlight the introduction, sections of the main content, conclusion, list of sources used. The table of contents on the right indicates the page numbers at the beginning of each question. Each section begins on a new page.

The total size of the report, depending on the chosen topic, can vary from 18 to 20 pages. The scope of the report is determined by the student's ability to briefly and comprehensively disclose the topic: the relevance of the topic under consideration, current trends and problems, analyze the best foreign and Ukrainian technologies, draw conclusions and justify their own suggestions and recommendations.

The report is accompanied by an annotation in two languages - Ukrainian and English, indicating keywords.

Mandatory requirement: clear reference to all sources of information. All figures, facts, opinions of scientists, quotations, formulas should have a reference in the form of [2, p.54] (the first digit means the source number in the list of references at the end of the creative work, and the second digit - the page number in this source). It is desirable to use tables, diagrams, graphs, charts, etc. The list of used sources (not less than 10 sources) is made out according to operating rules. If the information is taken from the Internet, you need, as for ordinary literature, to indicate the author, the title of the article, and then provide the address of the site on the Internet.

The report is evaluated by the following criteria: logical plan; completeness and depth of topic disclosure; reliability of the received data; reflection of practical materials and results of calculations; availability of illustrations (tables, figures, diagrams, screenshots of web pages, etc.); the number of sources used and the clarity of references to them; design; substantiation of the student's own opinion on this issue in the form of a conclusion.

Deadline for report submission: week 5.

The report is checked for plagiarism with the help of public resources and must meet the requirements of academic integrity. In case of academic dishonesty, the work is penalized and not assessed.

7. Policy of academic discipline (educational component)

Attending classes

Attendance of lectures and practical classes is not planned; however, attendance of individual consultations are recommended to all students. The grading system is focused on obtaining points for student activity, as well as performing tasks that are able to develop practical skills and abilities.

Missed consultations are not repeated.

Control measures missed

Missed controlled measures are not repeated.

Unchecked practice report for plagiarism is not assessed.

Violation of deadlines and encouragement points

Encouragement points		Penalty points *	
Criterion	Weight points	Criterion	Weight points
performance of tasks on improvement of didactic materials on the discipline	+1 point	Violation of the terms of control measures (for each control measure)	-1 point for each week
participation in scientific and research activities (with the provision of relevant documents)	+10 points	Late execution and submission of the report	From -2 points to -10 points (depending on the handling period)

* if the control measure was missed for a proved reason (illness, which is confirmed by a certificate of the established sample) - penalty points are not accrued..

Academic integrity

The policy and principles of academic integrity are defined in Section 3 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". Read more: <https://kpi.ua/code>.

Norms of ethical behavior

Normative principles of behavior of students and employees, defined in sections 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". Read more: <https://kpi.ua/code>.

Procedure for appealing the results of control measures

Students have the opportunity to raise any issue related to the control procedure and expect it to be addressed according to predefined procedures.

The student has the right to appeal the results of the control measure according to the approved provision on appeals in the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (approved by the order №NON/128/2021 from 20.05.2021) - <https://osvita.kpi.ua/index.php/node/182>

Inclusive education

The discipline "Radiation safety" can be taught to most students with special educational needs, except for students with severe visual impairments who do not allow to perform tasks using personal computers, laptops and / or other technical means.

Distance learning

Distance learning takes place through the Sikorsky Distance learning Platform «Sikorsky».

Distance learning through additional online courses on certain topics is allowed subject to agreement with students. If a small number of students wish to take an online course on a specific topic,

studying the material with such courses is allowed, but students must complete all the tasks provided in the discipline.

The list of courses is offered by the teacher after the students have expressed a desire (because the bank of available courses is updated almost every month).

The student provides a document confirming the completion of the distance course (in the case of a full course) or provides practical tasks from the distance course and subject to an oral interview with the teacher on the topics can receive grades for control measures provided for the studied topics (express control / test tasks, practical work).

Performance of practical works, and also performance of control homework, is carried out during independent work of students in a remote mode (with a possibility of consultation with the teacher through e-mail, social networks).

Learning the discipline in a foreign language

Teaching in English is carried out only for foreign students.

At the request of students, it is allowed to study the material with the help of English-language online courses on topics that correspond to the topics of specific classes.

8. Monitor and evaluate the system of evaluation of learning outcomes (Rating System of Evaluation)

Evaluation system (current control):

No s/n	Control measure	%	Weight points	Number	Total
1.	Assessment of the timely handled and complete package of the accompanying documents	10	10	1	10
2.	Evaluation of a written report	30	30	1	30
3.	Report defense.	60	60	1	60
Total					100

The assessment is carried out in accordance with the PROVISIONS ON THE PROCEDURE FOR CONDUCTING THE PRACTICE OF HIGHER EDUCATION OF KPI

Calendar control (CC) – not planned.

Semester certification of students

Mandatory condition for admission to the test		Criterion
1	Complete accompanying documents	RD ≥ 0 points
2	Positive assessment of the report	> 18 points

The results are announced to each student separately in the presence or remotely (by e-mail, or Sikorsky Platform). Also recorded in the system "Electronic Campus".

Optional conditions for admission to test:

none

Table of translation of rating points to grades on a university scale:

<i>Total rating points</i>	<i>Grades according to the university scale</i>
<i>100-95</i>	<i>Excellent</i>
<i>94-85</i>	<i>Very good</i>
<i>84-75</i>	<i>Good</i>
<i>74-65</i>	<i>Satisfactory</i>
<i>64-60</i>	<i>Passed</i>
<i>Below 60</i>	<i>Unsatisfactory</i>
<i>Violation of passing requirements</i>	<i>Not passed</i>

The test is carried out in accordance with the PROVISIONS ON THE PROCEDURE FOR CONDUCTING THE PRACTICE OF HIGHER EDUCATION ACTIVITIES KPI

9. Additional information on the discipline (educational component)

Detailed requirements for the implementation and design of the report and supporting documentation are given in the methodical guidelines for the discipline.

Work program of the discipline (syllabus):

Compiled by Senior lecturer of the Department of Biomedical Engineering Ovcharenko Anna Romanivna

Approved by the Department of Biomedical Engineering (protocol № ___ to _____)

Approved by the Methodical Commission of the Faculty of Biomedical Engineering (protocol № __ to _____)