

Міністерство освіти та науки України
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Кафедра іноземних мов

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МЕТОДИЧНІ РЕКОМЕНДАЦІЇ ТА НАВЧАЛЬНІ ЗАВДАННЯ

до практичних занять і самостійної роботи з
навчальної дисципліни

«Іноземна мова (за професійним спрямуванням) (англійська)»
для здобувачів вищої освіти першого (бакалаврського) рівня за
освітньо-професійною програмою «Біотехнології,
біоробототехніка та біоенергетика»
спеціальності 162 «Біотехнологія та біоінженерія»
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Методичні рекомендації та навчальні завдання до практичних занять і самостійної роботи з навчальної дисципліни «Іноземна мова (за професійним спрямуванням) (англійська)» для здобувачів вищої освіти першого (бакалаврського) рівня за освітньо-професійною програмою «Біотехнології, біоробототехніка та біоенергетика» спеціальності 162 «Біотехнологія та біоінженерія» денної форми навчання. [Електронне видання] / Тарасюк Н. М. – Рівне : НУВГП, 2023. – 37 с.

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Керівник групи забезпечення
спеціальності

162 «Біотехнологія та біоінженерія»

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Передмова

Методичні рекомендації та навчальні завдання до практичних занять і самостійної роботи з навчальної дисципліни «Іноземна мова (за професійним спрямуванням) (англійська)» для здобувачів вищої освіти ступеня «бакалавр» за освітньо-професійною програмою «Біотехнології, біоробототехніка та біоенергетика» спеціальності 162 «Біотехнологія та біоінженерія» денної форми навчання мають на меті допомогти студентові у його практичній та самостійній роботі над розвитком професійної комунікативної компетентності.

Для досягнення зазначеної мети передбачається виконання таких завдань:

➤ оволодіння найбільш уживаною лексикою у межах даної біотехнологічної тематики;

➤ отримання уявлення про оволодіння основними граматичними категоріями англійської мови, яка вивчається відповідно до інженерної тематики; розпізнавання відомого лексичного і граматичного матеріалу під час читання і застосування його у процесі усного спілкування та письма;

У результаті вивчення навчальної дисципліни студент повинен

знати: граматичні структури, що є необхідними для гнучкого передання відповідних понять, а також для розуміння професійної інформації; лексичні одиниці для інженерного тезаурусу .

вміти:

-*аудіювання:* розуміти обговорення проблем професійно-орієнтованого характеру в групі та в парах;

-*читання:* розуміти автентичні тексти, пов'язані з напрямом інженерії; розуміти головні ідеї та знаходити необхідну інформацію в неадаптованій технічній літературі за фахом; здійснювати ознайомлювальне та пошукове

читання неадаптованих технічних текстів для отримання інформації;

- *говоріння*: реагувати на основні ідеї та розпізнавати суттєво важливу інформацію під час обговорень, що пов'язані з особливостями професії; залучатися до обговорень професійно-орієнтованих тем в межах логічно зв'язаних усномовленневих форм спілкування на смислово-синтаксичному рівні.

- *письмо*: оволодіти професійними вміннями письмового мовлення (есе, презентація, висновок);

Кожен урок починається з завдання для вдосконалення глосарію спеціальних термінів. Тексти для читання дають можливість практичного застосування даних термінів. Післятекстові завдання дозволяють перевірити розуміння прочитаного за допомогою запитань для загального розуміння та критичного аналізу. Кожен урок закінчується вправами для коретного оформлення писемного висловлювання. Вкінці даного навчально-методичного видання містяться додаткові тексти в межах поданих тем.

Тема 1. Self-management, psychophysical, self-analysis for management of biotechnological processes

Speaking. Task 1.

In pairs, discuss the following questions

Which personality traits are crucial for personal and professional growth in control and management of biotechnological processes?

Why is self-analysis essential for teamwork in the organization of biotechnological production?

Vocabulary Focus. Task 2.

Match each word with its corresponding definition.

1. Integral	a. The process of improving or developing something, especially by careful attention, training, and effort.
2. Self-management	b. Something that is essential or necessary for completeness.
3. Pivotal	c. The state of being comfortable, healthy, or happy.
4. Psychophysical	d. The act of making something as effective or functional as possible.
5. Optimization	e. The state or quality of being advanced.
6. Cultivation	f. The complex combination of psychological and physical aspects.

7. Well-being	g. The action of managing or regulating oneself or one's activities.
8. Advancements	h. Extremely complex or detailed.
9. Intricate	i. A crucial point or central importance in a situation.
10. Pursuit	j. The action of following or chasing something

Grammar Focus. Task 3.

Read the sentences below and choose the correct verb form to fill in the blanks. The sentences focus on the key terms: Integral, Self-management, Pivotal, Psychophysical, Optimization, Cultivation, Well-being, Advancements, Intricate, and Pursuit.

1. Biotechnological processes _____ an essential role in various industries.

- a. played
- b. plays
- c. are playing
- d. has played

2. Effective self-management techniques _____ crucial for personal and professional growth.

- a. is
- b. are
- c. were
- d. have been

3. Setting achievable goals is _____ to success in self-management.

- a. pivotal

b. pivots

c. pivot

d. has pivoted

4. Professionals in the field of biotechnology _____
on psychophysical data for insights.

a. rely

b. relies

c. are relying

d. has relied

5. Understanding one's cognitive and physical limits
_____ individuals to make informed decisions.

a. enable

b. enables

c. enabling

d. has enabled

6. Time management strategies, such as setting realistic
deadlines, _____ productivity.

a. enhances

b. enhance

c. are enhancing

d. has enhanced

7. The integration of psychophysical data _____ in
the decision-making process.

a. plays

b. play

c. are playing

d. has played

8. Personal and professional growth _____ the pursuit of excellence.

- a. is
- b. are
- c. were
- d. have been

9. The intricate mechanisms involved in biotechnological processes _____ to be thoroughly understood.

- a. need
- b. needs
- c. are needing
- d. has needed

10. The constant advancements in technology _____ our approach to complex tasks.

- a. revolutionized
- b. revolutionize
- c. are revolutionizing
- d. have revolutionized

Reading Comprehension. Task 4.

Read the following text and answer the questions below: «The Crucial Role of Self-Management and Psychophysical Data in Biotechnological Processes»

Biotechnological processes have become an integral part of various industries, revolutionizing the way we approach complex tasks. However, amidst the advancements in technology, the significance of personal and professional growth through effective self-management techniques should not be overlooked. Self-management refers to the ability to prioritize

tasks, set achievable goals, and maintain a balance between work and personal life. This skill is pivotal for individuals involved in the control and management of biotechnological processes, as it ensures productivity and efficiency.

Moreover, the utilization of psychophysical data plays a key role in understanding the intricate mechanisms involved in biotechnological processes. By analyzing psychophysical data, professionals can gain valuable insights into the psychological and physical aspects that impact their performance. Understanding one's cognitive and physical limits enables individuals to make informed decisions, leading to better management of biotechnological processes.

In the pursuit of personal and professional growth, individuals must develop a keen understanding of self-management principles and the significance of psychophysical data. By incorporating effective time management strategies, such as setting realistic deadlines and prioritizing tasks, professionals can enhance their productivity and maintain a healthy work-life balance. Additionally, the integration of psychophysical data in the decision-making process can facilitate the optimization of biotechnological processes, leading to improved outcomes and increased efficiency.

In conclusion, the successful control and management of biotechnological processes heavily rely on the cultivation of self-management skills and the utilization of psychophysical data. By prioritizing personal and professional growth and recognizing the importance of balancing psychological and physical well-being, individuals can contribute to the

advancement of biotechnological practices while achieving their full potential.

Answer the questions:

1. What role do biotechnological processes play in various industries, according to the text?
2. How does effective self-management contribute to the control and management of biotechnological processes?
3. What does the term self-management refer to, as described in the text? Why is it crucial in biotechnological processes?
4. How does the analysis of psychophysical data benefit professionals involved in biotechnological processes?
5. What insights can individuals gain from understanding their cognitive and physical limits in the context of biotechnological processes?
6. According to the text, what strategies can professionals incorporate to enhance their productivity and maintain a healthy work-life balance?
7. How does the integration of psychophysical data facilitate the optimization of biotechnological processes, as discussed in the text?
8. What is the relationship between personal and professional growth, and the successful control and management of biotechnological processes, according to the text?
9. Why is it important for individuals to prioritize both psychological and physical well-being in the context of biotechnological practices, as emphasized in the text?
10. Do you agree with the idea that the cultivation of self-management skills and the utilization of psychophysical data are

essential for the successful control and management of biotechnological processes? Why or why not?

Writing activity. Task 5. Write a short paragraph (100-150 words) about a specific scenario in which a biotechnologist's critical thinking skills were crucial in solving a complex issue during a biotechnological process. Highlight the importance of this trait in the field.

Speaking Activity. Task 6.

Discuss the following questions with a partner:

1. How can effective time management improve the efficiency of biotechnological processes?
2. What specific skills are crucial for individuals to possess when working in a team in the context of biotechnological production?
3. What common challenges that individuals may encounter when working in a team in the organization of biotechnological production, and how can they be effectively addressed?
4. What specific skills are crucial for individuals to possess when working in a team in the context of biotechnological production?

Speaking Activity. Task 7.

Use for the following links for critical analysis and content discussion in the group.

<https://link.springer.com/article/10.1057/jcb.2009.19>

<https://ceoworld.biz/2022/07/07/3-traits-every-biotech-ceo-and-leader-should-have/>

<https://www.mccormick.northwestern.edu/biotechnology/inside-our-program/stories/2019/the-power-of-critical-thinking.html>

Tema 2. Ecological biotechnology

Speaking. Task 1.

In pairs, discuss the following questions

What is the link between biotechnology and environment?

What ecological biotechnology involves?

What is the role of biotechnology in environmental sustainability?

Vocabulary Focus. Task 2.

Match each word with its corresponding definition.

1. Environmental Challenges	a. The use of scientific and technological knowledge in manufacturing and other processes for commercial or industrial purposes
2. Industrial Application	b. The various issues and problems posed by human activities and natural processes that negatively impact the environment, such as pollution, climate change, and habitat destruction.
3. To restore ecosystems	c. Microorganisms that play crucial roles in various ecological processes.
4. Bacteria and Fungi	d. The process of bringing a damaged or degraded ecosystem back to a more natural and functional state
5. Biofertilizer	e. The variety of life on Earth
6. Biodiversity	f. Fertilizer that consists of living microorganisms, such as bacteria or fungi
7. Photosynthesis	g. The process by which green plants, algae, and some bacteria convert light energy

	into chemical energy in the form of glucose.
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Grammar Focus. Task 3.

Read theoretical information about passive voice
<https://grammarway.com/ua/passive-voice>

Rewrite the following sentences in the passive voice:

1. Scientists can engineer microorganisms to break down contaminants in the environment.
2. The process of bioremediation involves using beneficial bacteria to clean up polluted sites.
3. Biomimicry inspires scientists to design technologies based on the efficiency of natural processes.
4. Sustainable agriculture practices enhance soil fertility and reduce the reliance on chemical fertilizers.
5. Genetic engineering may contribute to the conservation of endangered species.
6. Researchers have discovered new possibilities for ecological conservation through genetic engineering.
7. The application of ecological biotechnology should address various environmental challenges.
8. Nature provides valuable insights that guide the development of sustainable technologies.
9. Humans should minimize their ecological impact to preserve the delicate balance of the planet.
10. Environmentalists are promoting the use of ecological biotechnology to address pollution.

Reading Comprehension. Task 4.

Read the following text and answer the questions below:

«Ecological Biotechnology: Harnessing Nature for a Sustainable Future»

In recent years, ecological biotechnology has emerged as a powerful tool in addressing environmental challenges and

promoting sustainability. This field combines principles of biology and technology to develop innovative solutions for ecological problems. Let's explore the key aspects of ecological biotechnology and its impact on the environment.

1. Understanding Ecological Biotechnology:

Ecological biotechnology involves the application of biological principles to solve environmental issues. Unlike traditional biotechnology, which may focus on industrial applications, ecological biotechnology emphasizes harmony with nature. It seeks to harness the capabilities of living organisms to restore ecosystems, mitigate pollution, and promote sustainable practices.

2. Bioremediation:

One prominent application of ecological biotechnology is bioremediation, a process that uses microorganisms to clean up pollutants in the environment. Bacteria and fungi can be engineered to break down contaminants, such as oil spills or industrial waste, into harmless byproducts. This approach minimizes the ecological impact of human activities and facilitates the recovery of damaged ecosystems.

3. Sustainable Agriculture:

Ecological biotechnology plays a crucial role in sustainable agriculture by promoting eco-friendly farming practices. Biofertilizers, for example, use beneficial microorganisms to enhance soil fertility and nutrient availability, reducing the reliance on chemical fertilizers. This not only improves crop yields but also preserves the health of the soil and surrounding ecosystems.

4. Genetic Engineering for Conservation:

Advancements in genetic engineering have opened new possibilities for ecological conservation. Scientists can modify the genes of endangered species to enhance their resilience to environmental challenges. This approach, known as genetic rescue, aims to preserve biodiversity and protect vulnerable ecosystems in the face of climate change and habitat loss.

5. Biomimicry:

Another fascinating aspect of ecological biotechnology is biomimicry, where researchers draw inspiration from nature to design sustainable technologies. By mimicking the efficiency of natural processes, such as photosynthesis or nutrient cycling, scientists develop innovative solutions that reduce environmental impact and promote resource efficiency.

Ecological biotechnology represents a promising avenue for addressing environmental concerns and building a sustainable future. As students, exploring this field offers not only a glimpse into cutting-edge scientific advancements but also an understanding of our role in preserving the delicate balance of our planet. By harnessing the power of nature, ecological biotechnology provides hope for a harmonious coexistence between human activities and the environment.

Answer the questions:

1. What is the main focus of ecological biotechnology, and how does it differ from traditional biotechnology?
2. How does ecological biotechnology contribute to sustainable agriculture?
3. Why is it important for students to learn about ecological biotechnology in the context of environmental conservation and sustainability?
4. What concerns or considerations should scientists take into account when applying this technology?

Writing activity. Task 5. Read about essay structure <https://www.port.ac.uk/student-life/help-and-advice/study-skills/written-assignments/basic-essay-structure> and write an essay «Sustainable biotechnological approaches in addressing environmental challenges».

Speaking Activity. Task 6.

Discuss the following questions with a partner:

1. Imagine you are a scientist working on a project related to ecological biotechnology. What specific environmental issue would you address, and how would you use ecological biotechnology to solve it?
2. If you were to design a technology inspired by biomimicry, what natural process would you choose, and how might it contribute to sustainability?

Speaking Activity. Task 7.

Use for the following links for critical analysis and content discussion in the group. Research and provide additional examples of real-world applications of ecological biotechnology that are not mentioned in the text.

<https://www.studysmarter.co.uk/explanations/biology/ecology/environmental-biotechnology/>

<https://www.nature.com/subjects/environmental-biotechnology>

https://www.mdpi.com/topics/AEB_AEB

Tema 3. Practical skills in biotechnology

Speaking. Task 1.

In pairs, discuss the following questions

How might scientists organize and understand data from experiments?

Can you think of a simple way to analyze results in a biotechnological study?

Vocabulary Focus. Task 2.

Match each word with its corresponding definition.

1. Microscope	a. A microscopic living organism, such as bacteria, viruses, fungi
2. Microorganism	b. A visual representation of data or information
3. Chart	c. A scientific instrument that magnifies and enables the observation of extremely small objects or details that are not visible to the naked eye.
4. Safety	d. The surroundings or conditions in which an organism, individual, or community exists and interacts.
5. Cell	e. The condition of being free from danger, harm, or risk.
6. Environment	f. The basic structural and functional unit of all living organisms.

Grammar Focus. Task 3.

Read theoretical information about conditionals <https://learnenglish.britishcouncil.org/grammar/b1-b2-grammar/conditionals-zero-first-second> and do grammar tests here <https://www.ego4u.com/en/cram-up/tests/conditional-sentences-3>, <https://www.perfect-english-grammar.com/conditionals.html>

Reading Comprehension. Task 4.

Read the following text and answer the questions below:

«Discovering Practical Skills in Biotechnology»

Welcome to the world of biotechnology, where practical skills are the key to unlocking the mysteries of life. Let's delve into some essential aspects for beginners.

Doing Experiments:

Biotechnologists often work in laboratories, doing experiments to learn more about living things. They follow specific steps to make sure their experiments are accurate and reliable.

Using Tools:

Imagine using special tools like microscopes to see things that are too tiny for our eyes. Biotechnologists also use machines that help them study and understand the secrets hidden in cells.

Growing Microorganisms:

Have you ever seen tiny living things under a microscope? In biotechnology, scientists grow these tiny beings, called microorganisms, to study how they behave and to help with important tasks.

Changing Genes:

Genetic engineering is like changing the recipe of a living thing. Scientists may change the genes of plants or animals to make them stronger or better suited to certain environments.

Understanding Data:

After all the experiments, there is a lot of information to understand. Biotechnologists use simple ways to organize this

data, like putting it into charts or graphs. This helps them make sense of what they've learned.

Staying Safe:

Safety is very important in biotechnology labs. Scientists wear special clothes and follow rules to make sure everyone is protected. It's like wearing armor to explore the amazing world of cells.

These are just the basics, like learning the ABCs of biotechnology. As you continue your journey, you'll discover more about how these practical skills help scientists uncover the incredible stories written in the language of life.

Answer the questions:

1. What is emphasized as the key to unlocking the mysteries of life in the world of biotechnology?
2. Where do biotechnologists often conduct their work, and what is the purpose of their experiments?
3. Why do biotechnologists follow specific steps in their experiments?
4. What tools do biotechnologists use, and how are these tools helpful in their work?

Speaking Activity. Task 5.

Discuss the following questions with a partner:

1. Imagine you are a biotechnologist conducting an experiment. What steps would you take to ensure the accuracy and reliability of your results?
2. If you were given the task of studying the behavior of microorganisms, what methods could you use, and why is this information valuable in biotechnology?
3. Consider a scenario where you need to change the genes of a plant to make it more resistant to pests. How would you approach this genetic engineering process?
4. As a biotechnologist, you have gathered a significant amount of data from your experiments. How would you organize this

data using charts or graphs, and why is this organization important?

Speaking Activity. Task 6.

Use for the following links for critical analysis and content discussion in the group.

<https://www.aeseducation.com/blog/what-are-21st-century-skills>

<https://scstemacademy.org/what-are-21st-century-skills/>

<https://gla.ac.in/blog/skills-required-to-find-the-best-career-scope-in-biotechnology/>

Writing and speaking activity. Task 7.

Read about the structure of presentation here

https://pennstatelearning.psu.edu/istudy_tutorials/oralpresentations/oralpresentations3.html and make up the presentation with the following topic «Practical skills in biotechnology».

Tema 4. Professions in biotechnology.Spheres in biotechnology

Speaking. Task 1.

In pairs, discuss the following questions

Can you describe some of the tasks that a biotechnologist might perform on a daily basis?

Besides working in a laboratory, what other career opportunities are there in biotechnology?

Vocabulary focus. Task 2.

Match each word with its corresponding definition.

1. Testing conditions	a. Small portions or examples taken for analysis or testing.
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2. Samples	b. Specific circumstances under which experiments or tests are conducted.
3. Lab reports	c. Problems or challenges related to the functioning of equipment or processes.
4. Operational issues	d. Documents summarizing the results and findings of laboratory
5. Technical specifications	e. Detailed descriptions of the technical requirements and features of equipment.
6. Software updates	f. Revisions or improvements made to computer programs.
7. Hardware adjustments	g. Planned routines for keeping equipment or systems in good working condition.
8. Maintenance schedules	h. Changes made to the physical components of machines or devices.
9. Emergency repair requests	i. The effect of human activities on the environment and ecosystems
10. Environmental impact	j. Urgent calls for immediate repairs in response to unforeseen issues.

Grammar Focus. Task 3.

Read theoretical information about adjectives and adverbs

<https://grammarway.com/ua/adjectives>

<https://grammarway.com/ua/adverbs>

<https://dictionary.cambridge.org/grammar/british-grammar/comparison-adjectives-bigger-biggest-more-interesting>

Nouns

<https://grammarway.com/ua/nouns>

Complete multiple-choice test for nouns and adjectives

1. Clinical technicians work in _____ environments to collect and process research and medical specimens.

- a. laboratories
- b. laboratory's
- c. lab's
- d. labs

2. Biomedical equipment technicians are responsible for overseeing the operation of _____ machines and tools.

- a. biomedical
- b. biomedical's
- c. biomedicine
- d. biometric

3. Pharmaceutical manufacturers produce medications, chemical compounds, and other _____ products.

- a. pharmaceutical
- b. pharmaceutical's
- c. pharmacist
- d. pharmacy

4. Scientists conduct experiments to learn more about _____ theories and practices.

- a. scientific
- b. scientist's
- c. science
- d. sciences

5. DNA analysts collect DNA samples and conduct tests to gather _____ information.

- a. genetics
- b. genetic's
- c. gene
- d. genes

6. Business development managers guide the strategic plan for large _____.

- a. companies
- b. company's
- c. companys'
- d. company

7. Product managers are responsible for developing specific consumer products from design to _____.

- a. distribute
- b. distribution
- c. distributed
- d. distributing

8. Bioprocess engineers supervise the production processes for biotechnological products and _____ like biofuels.

- a. equipments
- b. equipment's
- c. equip
- d. equipment

9. Environmental health and safety officers uphold federal and industry regulations related to workplace _____.

- a. hazards
- b. hazard's
- c. hazardous
- d. hazard

10. Pharmaceutical consultants give advice to medical manufacturers, pharmacists, and other healthcare organizations about how to source and distribute _____ products.

- a. pharmaceutical's
- b. pharmaceutical
- c. pharmacist
- d. pharmacies

11. Biostatisticians collect and analyze data related to living _____.

- a. organisms
- b. organism's
- c. organ
- d. organic

Reading Comprehension. Task 4.

Read the following text and answer the questions below:

«Top biotechnology careers to consider»

<https://www.indeed.com/career-advice/finding-a-job/biotechnology-careers>

Answer the questions:

1. What is the primary duty of a clinical technician, and what are the educational requirements for this profession?

2. What is the role of a biomedical equipment technician, and what tasks do they perform in their daily responsibilities?
3. What are the primary duties of a pharmaceutical manufacturer, and what qualifications do they typically hold for this position?
4. Describe the responsibilities of a scientist in the biotechnology field. What educational background is usually required for scientists specializing in biotechnology?
5. What does a biostatistician do, and what level of education is typically necessary for a career in this field?

Speaking Activity. Task 5.

Discuss the following questions with a partner:

1. As a product manager in the biotechnology industry, how would you go about developing a new medical device from design to distribution?
2. If you were a DNA analyst, explain how you would conduct tests to gather genetic information and collaborate with law enforcement in a criminal trial.
3. Imagine you are a bioprocess engineer. How would you supervise the production processes for biotechnological products, such as pharmaceuticals or biofuels?
4. Which professions in biotechnology does NUWMEE prepare to? What are eligibility requirements to apply for these jobs?

Speaking Activity. Task 6.

Use for the following links for critical analysis and content discussion in the group.

<https://aimst.edu.my/event-news/jobs-require-bachelor-biotechnology/>

<https://www.reva.edu.in/blog/5-major-spheres-of-biotechnology-that-offer-great-career-opportunities>

Writing activity. Task 7.

Write summaries for texts in links above. Exchange them with your groupmates, assess each other's summaries by the following criteria:

1. Vocabulary mistakes;
2. grammar mistakes;
3. content appropriateness;
4. structure of summary.

Tema 5. Modern achievements in biotechnology

Speaking. Task 1.

In pairs, discuss the following questions

What are some recent breakthroughs in biotechnology?

How are biotechnological innovations contributing to sustainable agriculture and addressing global food security challenges?

Vocabulary focus. Task 2.

Match each word with its corresponding definition.

1. Biosensors	a. An enhanced view of the real world overlaid with computer-generated information, applied in medical contexts.
2. Exponential Growth	b. Devices or technologies designed to detect and monitor biological signals or

	substances, often used in medical applications.
3. Augmented Reality	c. Rapid and increasing growth at an accelerating rate.
4. CRISPR Therapeutics	d. A biotech company specializing in genetic engineering and gene therapy.
5. Disruptive Tech	e. Technologies that significantly alter or revolutionize established industries or practices.

Grammar Focus. Task 3.

Read theoretical information about infinitives and gerunds

<https://grammarway.com/ua/infinitive>

<https://grammarway.com/ru/gerund>

Fill in the blanks with either the gerund ("-ing" form) or the infinitive ("to" + base form of the verb) of the verbs in the following sentences.

1. Devices or technologies designed (detect) and (monitor) biological signals or substances, often (use) in medical applications.

2. Rapid and increasing growth at an accelerating rate can be challenging (understand) without (apply) advanced mathematical models.

3. (Develop) technology to create an enhanced view of the real world, (overlay) with computer-generated information, has greatly (impact) medical contexts.

4. Innovators aim (create) technologies that have the potential (significantly alter) or (revolutionize) established industries or practices.

5. Researchers are constantly (explore) new ways (apply) CRISPR technology in genetic engineering and gene therapy to (treat) various genetic disorders.

Reading Comprehension. Task 4.

Read the following text and answer the questions below:
«Biotech innovation»

<https://www.hult.edu/blog/biotech-innovation-6-exciting-developments/>

Answer the questions:

1. How does the author describe the pace of technological progression in the field of biotechnology over the past century?
2. What is the focus of the text?
3. Which innovation in biotech is the most exciting for you? Why?
4. Which biotech breakthrough is connected with what you have already studied in biotechnology?

Speaking Activity. Task 5.

Discuss the following questions with a partner:

1. In your opinion, which biotech innovation mentioned in the article has the most significant impact on society? Justify your choice.

2. How might the development of bioplastics and biofuels contribute to addressing environmental challenges on a global scale?

3. Evaluate the role of virtual and augmented reality (VR & AR) in biotech innovation. How might these technologies enhance medical training and patient care?

4. Reflect on the statement that «the future for biotechnology and biotech innovation is already shaping up to be a very tumultuous time. What challenges and opportunities might this tumult bring to the field of biotechnology?

Speaking Activity. Task 6.

Use for the following links for critical analysis and content discussion in the group.

<https://www.efsa.europa.eu/en/topics/topic/new-advances-biotechnology>

<https://in-part.com/blog/top-biotechnology-innovations/>

Writing activity. Task 7.

Write the essay on the topic «The best modern achievements in biotechnology from my viewpoint».

Tema 6. Biotechnology and society

Speaking. Task 1.

In pairs, discuss the following questions

How do you think biotechnological advancements pose ethical challenges to society?

How do you think the general public perceives biotechnological advancements?

What steps can be taken to improve public understanding and acceptance of biotechnology?

Vocabulary focus. Task 2.

Match each word with its corresponding definition.

1. Bioethics	a. An advantage, profit, or positive outcome gained from a particular action, decision, or situation.
2. A thinking toolkit	b. To produce a change or influence something. In the context of biotechnology, it may refer to the impact or influence that biotechnological developments have on individuals, societies, or the environment.
3. Benefit	c. A set of cognitive tools, strategies, or techniques designed to facilitate critical thinking, problem-solving, and decision-making.
4. Affect	d. The study of ethical issues and moral implications arising from biological and medical sciences.

Grammar Focus. Task 3.

Read theoretical information about modal verbs

<https://learnenglish.britishcouncil.org/grammar/english-grammar-reference/modal-verbs>

Do the following tests

<https://test-english.com/grammar-points/b1/modal-verbs-of-deduction/>

<https://agendaweb.org/verbs/modals-exercises.html>

Grammar Focus. Task 4.

Fill in the blanks with appropriate modal verbs (can, needs, must, should).

1. People's different needs and values _____ play a crucial role in shaping public perception of biotechnological advancements and affect it greatly.
2. Ethical considerations _____ be carefully addressed in the development of thinking toolkit about implementation of biotechnologies.
3. It is highly recommended that regulations and guidelines _____ be established to minimize risks associated with biotechnological research and applications.
4. Public awareness _____ be raised to foster a better understanding of the benefits and potential risks of biotechnological innovations.

Reading Comprehension. Task 5.

Read the following text and answer the questions below:

«Impacts of biotechnology on society»

<https://www.sciencelearn.org.nz/resources/1209-impacts-of-biotechnology-on-society>

Answer the questions:

1. What played a key role in the rapid increase in the number and range of biotechnologies in the last century?
2. What are biotechnologies developed for, as mentioned in the text?
3. What factors are highlighted in the text as influencing the impacts of biotechnologies on society?

Speaking Activity. Task 6.

Discuss the following questions with a partner:

1. How might differing views on biotechnological practices based on cultural or religious beliefs influence the progress and availability of certain biotechnologies?
2. In your opinion, why do biotechnology developments often become controversial, and how does public debate contribute to shaping societal views?
3. How might society's acceptance of cutting-edge biotechnologies change over time?

Speaking Activity. Task 7.

Use for the following links for critical analysis and content discussion in the group.

<https://blog.peli.com/areas-of-interest/it-science/how-does-biotechnology-benefit-humanity>

<https://carnegieendowment.org/2020/11/20/blessing-and-curse-of-biotechnology-primer-on-biosafety-and-biosecurity-pub-83252>

Writing activity. Task 8.

Prepare presentation for the topic «Biotechnology and society». Assess your groupmates' presentations by the following criteria:

1. Grammar and vocabulary mistakes
2. Content mistakes
3. Structure of presentation

Additional texts

Biotechnology Innovations In Developing Nations

Traditionally, the United States has been viewed as the world leader in biotechnology innovation, with over 1,200 biotech companies employing almost 200,000 workers in fields ranging from human product development to food and agriculture services. Yet, as globalization becomes more prominent and technology spreads worldwide, other nations have come to the forefront of the biotech arena. Successful research and development in biotechnology is occurring in developing countries such as Brazil, China, Cuba, Egypt, India, Kenya, South Africa, and South Korea. Although these nations are at varying points in their respective economic development, each can be considered an “innovating developing country” in biotechnology with both public and private industry support (Saha 2004). A focus on local health issues as well as national education and healthcare, government involvement, leveraging core competencies, and private sector funding are all key identifiable factors for success in many innovative developing countries, which speaks volumes about what it takes to be successful in burgeoning markets.

The biotechnology industries in the United States and Western Europe tend to focus on high-cost solutions for the kinds of chronic diseases that are predominant, namely, cardiovascular disease, diabetes, and tobacco-related conditions. Of the 1,393 new products marketed by Western biotechnology companies from 1975 to 1999, only 16 were for so-called “tropical diseases” and tuberculosis — the major public health issues in developing nations (Troullier 2002).

What are the new innovations in biotech?

Each day we discover things and as days go by, we usually strive towards improving and making the best out of our discoveries. Trends in Biotech have propelled speedy innovations.

The innovations have very well led to industry expansion. As at last year September the global biotechnology market was valued at 752.8 billion and growing.

It is important for companies to understand these trends. The sole purpose being profiting from the massive growth.

Biotech is sure undergoing an evolution. Some of the trends in Biotech include:-

Drug research.

This is one of the most promising Biotech trend. In the past a lot of time was taken in the production. It could run for years. Getting participants for the trials was also a big hustle. Biotech companies can now quickly analyze data from current trials and revisit data from previous trials. The introduction of new machines that enable them to carry out test and get instant results. This advancement has played a very key role especially in providing more accurate diagnosis. Other than it has helped in devising enhanced medicines and treatment paths for patients.

Personalized medicine.

Reduced time and cost has led to the growing of personalized medicine. The first genome sequencing project (genome sequencing is the process of determining the entirety or nearly entirety of the DNA sequence of an organism's genome at a single time.) that began in 1990 took about 13 years and \$ 2.7 billion to complete. As at now one is able to access a quick at home genome sequencing test for around \$299. Personalized biotech has made it possible for medical professionals to analyze genetics to identify medical risks in patients. It has played a vital role in helping doctors develop unique, tailor-made health solutions.

Big data

There is a lot of data to be analyzed. Sensor integration and the internet of things allow biotech researchers to fuel their innovations with unparalleled access to data.

Synthetic Biology

It involves redesigning organisms for useful purposes by engineering them to have new abilities. Examples include; biofabricated electronic film, automated corona virus testing using sequencing. Etc.

Artificial intelligence

Biotech companies have placed artificial intelligence to ensure the smooth running of variety operational processes through enhanced automation.

The current world has placed a massive interest in biotech. The aforementioned trends are going to continue as the growth in the industry continues.

Література:

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2. Методичні вказівки та навчальні завдання для практичних занять і самостійної роботи з дисципліни «Практичний курс англійської мови» для здобувачів вищої освіти першого бакалаврського рівня за освітньо-професійною програмою «Біотехнології, біоробототехніка та біоенергетика» спеціальності 162 «Біотехнологія та біоінженерія» денної форм навчання [Електронне видання] / Тарасюк Н. М., Шикун А. В. Рівне : НУВГП, 2023. 46 с.
<https://ep3.nuwm.edu.ua/25544/>

3. Hien L. English for biotechnology. Vietnam, Bin Duong University, 2008. 58 p.