**МІНІСТЕРСТВО НАУКИ І ОСІВТИ УКРАЇНИ**
**ОДЕСЬКИЙ ДЕРЖАВНИЙ АГРАРНИЙ УНІВЕРСИТЕТ**
**КАФЕДРА СУСПІЛЬНО-ГУМАНІТАРНИХ НАУК**

# ДІЛОВА АНГЛІЙСЬКА МОВА

## МЕТОДИЧНІ РЕКОМЕНДАЦІЇ

**до практичних занять для здобувачів**
**другого (магістерського) рівня освіти**
**спеціальність 193 Геодезія та землеустрій**

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**Зміст**

## Вступ

Дані методичні вказівки призначені для здобувачів І курсу другого (магістерського) рівня освіти денної та заочної форм навчання, аграрного навчального закладу, спеціальності 193 Геодезія та землеустрій.

Метою цих методичних вказівок є формування та розвиток загальних компетентностей: ЗК01. Здатність виявляти, ставити та вирішувати проблеми.ЗК02.Здатність спілкуватися іноземною мовою. ЗК 05.Здатність до адаптації та дії в новій ситуації. У результаті вивчення освітнього компонента здобувач вищої освіти другого (магістерського рівня) повинен знати: як самостійно готувати повідомлення про проблему, мету, методи та засоби дослідження, експеримент, опрацювання даних, висновки, складати іноземною мовою анотації та реферати наукових статей, доповідей, матеріалів дослідження, вести й інші види наукової роботи.

Крім того, здобувач повинен вміти: вільно користуватися іноземною мовою як засобом професійного спілкування, а також спілкуватись під час наукової дискусії та елементарного спілкування в межах побутової тематики. РН02.Вільно спілкуватися усно і письмово державною та іноземною мовами з питань професійної діяльності, досліджень та інновацій у сфері геодезії та землеустрою.

Методичні вказівки складаються з 10 розділів (10 Units) ідентичних за структурою, кожен з яких містить навчальний текст, ситему вправ та завдань на засвоєння лексики, розуміння прочитаних матеріалів, обговорення запропонованих питань. Кожен розділ завершується творчим завданням, що дає змогу здобувачам продемонструвати набуті компетенції.. У розділах пропонується робота над професійно орієнтованими текстами , які передбачені робочою програмою освітнього компонента 03 01 Ділова іноземна мова. Така структура дає можливість підготувати здобувача до складання іспиту в кінці курсу вивчення англійської мови, збагачує словниковий запас, розвиває комунікаційні та професійні навички. Методичні вказівки складаються з двох блоків інформації, фокусом яких є професійна та наукова англійська мова.

Перша частина посібника містить матеріали, присвячені темам «геодезія», «землевпорядкування», «вибір професії»,. Друга частина методичних вказівок присвячена питанням науково-дослідної роботи: «написання резюме», «написання статті», «доповідьна конференції».

Отже, дані методичні вказівки стануть у нагоді кожному здобувачу другого (магістерського) рівня вищої освіти спеціальності 193 Геодезія та землеустрій.

## Unit1. Geodesy in the USA

**Exercise I. Remember the following words**:

| | |
|---|---|
| geodetic | /dʒiɒˈdətik/ |
| framework | /ˈfreɪmwə-k/ |
| infrastructure | /ˌinfrəˈstrəkchər/ |
| satellites | /ˈsatəlaɪts/ |
| gravity | /ˈgravəti/ |
| coastlines | /ˈkoʊstˌlaɪnz/ |
| earthquake | /ˈərθˌkweɪk/ |
| rotation | /roʊˈteɪshən/ |

**Exercise II. Read, translate and retell the text:**

### Geodesy in the USA

The National Geodetic Survey (NGS), under NOAA, maintains the official geodetic framework for the entire USA, ensuring precise measurements and positioning. From mapping vast coastlines to monitoring tectonic movements, american geodesists play a crucial role in infrastructure, navigation, and scientific research.GPS satellites provide real-time positioning data, but, however, NGS ground stations are especially essential for accuracy and calibration. Geodetic techniques like LiDAR map landscapes, from towering mountains to intricate cityscapes, with incredible detail. Studying gravity variations across the United States of America reveals insights into Earth`s crustal structure and hidden geological features. It must be note that sea level variations along the US coasts are closely monitored by NGS, providing critical data for climate change adaptation. Moreover, precise geodetic measurements help ensure the smooth operation of critical infrastructure, from power grids to communication networks. In addition, first of all, geodetic data is vital for accurately surveying and registering land, impacting everything from property boundaries to construction projects. Secondly, studying the motions of tectonic plates, particularly in California and Alaska, helps assess earthquake risks and preparedness.

**Exercise III. Answer the following questions:**

1. How does the National Geodetic Survey ensure the accuracy of GPS data in the USA? Explain it.
2. What specific techniques are used by US geodesists to study gravity variations? And what about Ukrainian ones.
3. How are sea level variations monitored by NGS, and how does this information help with climate change adaptation? Explain it.
4. In what ways do geodetic measurements impact the operation and maintenance of critical infrastructure? Compare France and germany
5. How has studying tectonic plate movement in specific regions like California and Alaska improved earthquake preparedness? What about other regions.

**Exercise IV. Fill in the gap with words:** *framework, satellites, coastlines, tectonic, earthquake, positioning, rotation, infrastructure, gravity, volunteers***:**

1. The National Geodetic Survey provides the official _____ for precise measurements and positioning across the USA.
2. _____ like GPS help us navigate and track our location, but they need ground stations for accuracy.
3. Geodesy uses techniques like LiDAR to map everything from mountains to cityscapes in great _____.
4. Studying _____ variations across the US reveals secrets about Earth's crust and hidden features.
5. NGS monitors sea level changes along the _____ to understand climate change and protect coastal areas.
6. Precise _____ data is crucial for the smooth operation of important structures like bridges and power lines.
7. Studying the movement of _____ plates helps scientists predict and prepare for potential _____.
8. The US works with other countries to improve global _____, benefiting everyone on Earth.
9. Scientists use data from _____ stations to understand the Earth's _____ and its impact on climate.
10. Many _____ contribute valuable data and time to support geodetic research and projects.

**Exercise V. Discuss these points:**

1. Why have you chosen Master's course? Give at least 3 reasons.

2. What is the difference between Master's and Bachelor's course in Ukraine? Give at least 5 differences.

3. What are European scientific degrees? Compare at least 3 West-European countries with 3 East-European countries.

4. What is geodesy? Say at least 5 sentences.

**Exercise VI. Scan the text and say what the following abbreviations stand for:**

NGS, NOAA, LiDAR, GPS, USA.

## Unit 2. Geodesy in the United Kingdom of Great Britain and Northern Ireland

**Exercise I. Read, learn new words and find out their translation in the dictionary:**

| | |
|---|---|
| Geodesy | /dʒiˈɒdəsi/ |
| Satellite technology | /ˈsætəlaɪt tɛkˈnɒlədʒi/ |
| GNSS (Global Navigation Satellite System) | /dʒiːɛnɛsɛs/ |
| Geoid modeling | /ˈdʒiːɔɪd ˈmɒdlɪŋ/ |
| InSAR (Interferometric synthetic aperture radar) | /ˈɪnsɑːr/ |
| GPS stations | /ˌdʒiːpiːˈɛs ˈsteɪʃənz/ |
| RTK (Real-time kinematic) positioning systems | /ɑːr tiː keɪ/ |

**Exercise II. Read and translate the text:**

### Geodesy in the United Kingdom of Great Britain and Northern Ireland

Geodesy in Great Britain employs advanced satellite technology to precisely measure the Earth's shape and gravitational field. Firstly, the Ordnance Survey of Great Britain utilizes modern geodetic techniques to create accurate topographic maps. Despite, GNSS (Global Navigation Satellite System) plays a pivotal role in contemporary geodesy across the Great Britain. Secondly, geodetic observatories in the Great Britain monitor subtle changes in the Earth's crust using sophisticated instruments. Many geodesists in the Great Britain collaborate with different international organizations to standardize geodetic measurements. It is worth noting,

that continuous GPS stations dot the landscape of Great Britain, providing crucial data for geodetic research. Moreover, geoid modeling is a fundamental aspect of modern and innovative geodesy in the Great Britain, aiding in various applications such as satellite navigation. For example, interferometric the synthetic aperture radar (InSAR) technology is revolutionizing how modern geodesists monitor ground deformation in the England and Wales. By the way, real-time kinematic (RTK) positioning systems are widely used in the territory of all country for centimeter-level accuracy in geodetic surveys.

**Exercise III. Fill in the gaps with appropriate terms from the text:**

Geodesy in Great Britain utilizes advanced satellite technology to precisely measure the Earth's _____ and gravitational field. The Ordnance Survey of Great Britain employs modern geodetic techniques to create accurate _____ maps. GNSS (Global Navigation Satellite System) is pivotal in contemporary geodesy across Great Britain, aiding in precise _____. Geodetic observatories in Great Britain monitor subtle changes in the Earth's crust using sophisticated _____.

Geodesists in Great Britain collaborate with international organizations to standardize geodetic _____. Continuous GPS stations across Great Britain provide crucial data for _____ research. Geoid modeling is fundamental in modern geodesy in Great Britain, aiding in various applications such as satellite _____. Interferometric synthetic aperture radar (InSAR) technology is revolutionizing how geodesists monitor _____ in Great Britain.

**Exercise IV. Match the following terms with their corresponding descriptions:**

1. Global Navigation Satellite System (GNSS)
2. Geoid modeling
3. Interferometric synthetic aperture radar (InSAR)
4. Real-time kinematic (RTK) positioning systems
5. Geodetic observatories
6. Remote sensing techniques
7. Geodetic datum transformations

8. Continuous GPS stations
9. Geodetic surveys
10. National Geospatial-Intelligence Agency (NGA)

a. Utilized to monitor subtle changes in the Earth's crust using sophisticated instruments.
b. Revolutionizing ground deformation monitoring with advanced radar technology.
c. Ensures compatibility and accuracy across geospatial datasets.
d. Provide crucial data for centimeter-level accuracy in geodetic surveys.
e. Precisely measures the Earth's shape and gravitational field using advanced satellite technology.
f. Fundamental aspect aiding various applications such as satellite navigation.
g. Aids in understanding tectonic movements and seismic hazards.
h. Used to create accurate topographic maps.
i. Integration of LiDAR and other technologies into geodesy practices.
j. Relies on geodetic data for national security and defense purposes.

**Exercise IV. One word is wrong in each sentence. Find it and correct.**

1. Geodetic data collected in Great Britain don`t support infrastructure development and urban planning projects.
2. Advanced geodetic hardware and algorithms enable geodesists in Great Britain to process vast amounts of data efficiently.
3. Geodetic datum transformations are not essential for ensuring compatibility and accuracy across geospatial datasets in Great Britain.
4. Geodesy plays a small role in maritime navigation safety around the coasts of Great Britain.
5. Geodetic measurements in Great Britain help monitor and manage natural resources such as mountains.

7. The integration of geodesy with other disciplines such as phylosophy and meteorology enhances our understanding of Earth's dynamic systems in Great Britain.

**Exercise V. Scan the text and say what the following abbreviations stand for:**

GNSS, INSAR, GPS.

**Exercise V. Translate the following word combinations into Ukrainian:**

Geodetic measurements, advanced satellite technology, the Earth's crust, a pivotal role, gravitational field.

## Unit 3. Land monitoring in Canada

**Exercise I. Remember the words**:

| | |
|---|---|
| Remote sensing technologies | /rɪˈmoʊt ˈsɛnsɪŋ ˌtɛkˈnɒlədʒiz/ |
| LiDAR (Light Detection and Ranging) | /ˈlaɪdɑːr/ |
| Geological hazards monitoring | /dʒiːəˈlɒdʒɪkəl ˈhæzərdz ˈmɒnɪtərɪŋ/ |
| Indigenous knowledge | /ˌɪndɪˈdʒɛnəs ˈnɒlɪdʒ/ |
| Canadian Space Agency (CSA) | /kəˈneɪdiən speɪs ˈeɪdʒənsi/ |
| Climate change monitoring | /ˈklaɪmət tʃeɪndʒ ˈmɒnɪtərɪŋ/ |

**Exercise II. Read, translate and retell the text:**

### Land monitoring in Canada

It is very interesting that land monitoring in Canada encompasses a comprehensive array of techniques and technologies aimed at understanding and managing the vast and diverse landscapes of the country. First of all, Canadian land monitoring initiatives utilize state-of-the-art remote sensing technologies, including satellite imagery and LiDAR (Light Detection and Ranging), to capture detailed information about land cover, land use, and land change dynamics. By the way, the Canadian government, alongside provincial and territorial authorities, collaborates to establish robust monitoring programs that track various environmental indicators, such as deforestation, urban sprawl, and agricultural expansion. Secondly, these efforts are

crucial for informing the modern land management policies and sustainable development strategies across Canada's diverse ecosystems, including many forests, different wetlands, and agricultural lands. Thirdly, remote sensing data are integrated with ground-based measurements and field surveys to validate and enhance the accuracy of land monitoring information. In addition to environmental monitoring, land monitoring programs in Canada also encompass monitoring of geological hazards, such as landslides, earthquakes, and permafrost degradation, which pose significant risks to infrastructure and communities. We suppose that indigenous knowledge and traditional land-use practices play a vital role in Canadian land monitoring initiatives, moreover, contributing valuable insights into ecosystem dynamics and resilience. The Canadian Space Agency (CSA) supports land monitoring efforts by providing access to satellite data and fostering research and innovation in remote sensing technologies.

**Exercise III. Match the following terms with their corresponding descriptions:**

1. Remote sensing technologies
2. LiDAR (Light Detection and Ranging)
3. Geological hazards monitoring
4. Indigenous knowledge
5. Canadian Space Agency (CSA)
6. Climate change monitoring
7. Geospatial technologies
8. Citizen science initiatives
9. Data sharing and open-access policies
10. Artificial intelligence and machine learning

a. Involves assessing the impacts of climate variability and extreme weather events on ecosystems and landscapes.

b. Utilized for capturing detailed information about land cover, land use, and land change dynamics.

c. Integral component focusing on assessing geological risks such as

landslides, earthquakes, and permafrost degradation.

d. Plays a vital role in providing valuable insights into ecosystem dynamics and resilience.

e. Supports land monitoring efforts by providing access to satellite data and fostering research and innovation.

f. Facilitates the integration and analysis of diverse datasets for holistic land monitoring and assessment.

g. Engages citizens in collecting and analyzing land monitoring data, fostering public awareness and participation.

h. Promotes transparency and accessibility to land monitoring information.

i. Holds promise for enhancing the efficiency and accuracy of land monitoring processes.

j. Involves the use of advanced technologies to measure distances and create detailed terrain models.

**Exercise IV. Put the verbs in correct form:**

1. Canada's commitment to international collaborations … global land monitoring networks and facilitates the exchange of best practices and scientific knowledge (to strengthen ).

2. Continuous monitoring of land cover changes … identify areas of ecological significance, biodiversity hotspots, and priority conservation areas for protection and restoration efforts (to help).

3. Data sharing and open-access policies … transparency and accessibility to land monitoring information, empowering stakeholders to make informed decisions and contribute to sustainable land management practices (to promote).

4. These efforts … crucial for informing land management policies and sustainable development strategies across Canada's diverse ecosystems (to be).

5. What potential challenges do you ….. in implementing and maintaining computer-intensive geodesy projects? (to anticipate)

**Exercise V. Based on the text, formulate the idea of:**

Land monitoring in Canada
Climate change monitoring
Geospatial technologies

## Unit 4. Computer technology and geodesy

**Exercise I. Remember the words**:

| | |
|---|---|
| Computational | /ˌkɒmpjʊˈteɪʃənl/ |
| Algorithms | /ˈælgəˌrɪðəmz/ |
| Geographic Information Systems (GIS) | /ˌdʒiːoʊˈgræfɪk ˌɪnfərˈmeɪʃən ˈsɪstəmz (dʒiː aɪ ˈɛs)/ |
| Cloud computing | /klaʊd kəmˈpjuːtɪŋ/ |
| Cyberinfrastructure | /ˌsaɪbərˈɪnfəˌstrʌkʧər/ |
| Numerical models | /ˈnjuːmərɪkəl ˈmɒdəlz/ |
| Open-source software | /ˈoʊpən-sɔːrs ˈsɒftwɛər/ |

**Exercise II. Read and translate the words and word combinations:**

Geographic Information Systems (GIS)

Real-time kinematic (RTK) positioning systems

Machine learning

Cloud computing

Numerical models

Cyberinfrastructure

Open-source software

**Exercise III. Read and translate the text:**

Everybody knows that computer technology plays a pivotal role in modern geodesy work, revolutionizing how geodetic measurements are collected, are processed, and are analyzed. It is well-known fact, that geodesy, the science of measuring and

monitoring the Earth's shape, gravity field, and rotation, relies heavily on computational tools and techniques for data management and analysis. Geodetic measurements collected from satellites, ground-based stations, and other sensors are processed using sophisticated computer algorithms to determine precise positions and elevations on Earth's surface. Moreover, high-performance computing systems enable modern geodesists to handle vast amounts of data and perform complex calculations required for geodetic modeling and analysis. By the way, geographic Information Systems (GIS) are essential important computer tools used in geodesy work for spatial data management, visualization, and analysis. In our opinion, computer software packages dedicated to geodesy, such as GNSS processing software and geodetic modeling software, facilitate precise positioning and modeling of Earth's reference frames. We are convinced that real-time kinematic (RTK) positioning systems, integrated with 21$^{st}$ century computer technology, provide centimeter-level accuracy in geodetic surveys and navigation applications.

**Exercise IV. Answer the following questions:**

1. How does computer technology contribute to modern geodesy work? Prove your answer.
2. What are some examples of computer tools and software used in geodesy?
3. How do real-time kinematic (RTK) positioning systems enhance geodetic surveys?
4. What role do machine learning and artificial intelligence play in geodesy?
5. What does cloud *computing platforms* mean in geodesy?
6. How are AI used in geodesy research? Do you agree with AI using in your country?
7. What are some practical applications of geodesy that rely on AI technology?

**Exercise V. Make up as many word combinations with new words as you can:**

Machine learning, Cloud computing, Numerical models, Cyberinfrastructure, Open-source software.

## Unit 5. Geodesy and land management

**Exercise I. Remember the following words and word expressions:**

| | |
|---|---|
| Land management | /lænd ˈmænɪdʒmənt/ |
| Boundaries | /ˈbaʊndəriz/ |
| Surveys | /ˈsɜrveɪz/ |
| Sustainable | /səˈsteɪnəbl/ |
| Erosion | /ɪˈroʊʒən/ |
| Deforestation | /ˌdiːfɔːrɪˈsteɪʃən/ |
| Stakeholder | /ˈsteɪkhoʊldər/ |
| Administration | /ədˌmɪnɪˈstreɪʃən/ |

**Exercise II. Read, translate and retell the text:**

### Geodesy and land management

We must say that geodesy and land management are important for Ukraine's environment and development. We know that geodesy helps measure and map the Earth's surface. First of all, it helps establish land boundaries and monitor how land is used. Obviously, with geodetic surveys, Ukraine can divide land for farming, homes, and businesses. Contemporary Geographic Information Systems (GIS) are tools that help manage and analyze land data. Undoubtedly, they help make smart decisions about land use. Definitely geodesy also helps solve land ownership problems and settle land disputes. Up-to-date Ukraine has diverse landscapes, like beautiful plains, large forests, and high mountains, which need very careful management. Geodesic data from satellites and surveys tell us about land cover and changes in Ukraine's environment. Sustainable land management protects soil, plants, and animals. It also guides how cities grow and use land responsibly. Geodesic monitoring helps track problems like erosion and deforestation, so Ukraine can take action. We must admit, Ukraine works with different groups, like government, scientists, and local people, to manage land well. Finally geographic Information Systems (GIS) are becoming more important in registering land and planning how it's used. Firstly, technology like

satellite systems and remote sensing gives accurate land information. Secondly, climate change is considered in land management plans to prepare for extreme weather and rising sea levels. After all, people's involvement is important for good land management in Ukraine. In conclusion, training programs help people learn about geodesy, land surveying, and land administration. As a result, geodesy and land management in Ukraine aim to use land wisely, protect nature, and help the country grow.

**Exercise III. Match the following terms with their corresponding descriptions:**

1. Geodesy
2. Land management
3. Geographic Information Systems (GIS)
4. Sustainable land management
5. Diverse landscapes
6. Geodetic monitoring
7. Stakeholder collaboration
8. Remote sensing technology
9. Climate change adaptation
10. Training programs

a. Utilizes satellite imagery and aerial photography to gather land information.
b. Involves measuring and mapping the Earth's surface for accurate land management.
c. Focuses on responsible use of land resources while protecting the environment.
d. Refers to various types of land, including plains, forests, and mountains.
e. Helps assess changes in land cover, erosion, and deforestation trends.
f. Engages different groups like government, scientists, and local communities.

g. Aims to prepare for and address the impacts of climate variability.

h. Implements strategies to ensure skilled professionals in geodesy and land management.

i. Utilizes technology to manage and analyze spatial data for informed decision-making.

j. Involves planning and decision-making to optimize land use and development.

**Exercise IV. Answer the following questions:**

1. How can you describe land management in Ukraine?
2. How are Geographic Information Systems (GIS) helpful in land management in Ukraine?
3. What are two examples of diverse landscapes mentioned in the text?
4. Why is geodetic monitoring important in land management practices in Ukraine and other countries?
5. Compare the role of technology, such as satellite systems and remote sensing in land management in EU and Ukraine .
6. How can you describe the climate in Ukraine? What factors does Ukraine consider in land management plans regarding the climate?
7. What are the main goals of geodesy and land management in Ukraine, according to the text? What is your point of view?

**Exercise V. Give the definition in English for these key terms:**

Geodesy

Land boundaries

Geographic Information Systems (GIS)

Diverse landscapes

Sustainable land management

Geodetic monitoring

Stakeholder collaboration

Remote sensing technology

Climate change adaptation

**Exercise VI.** ***Discuss the following points:***

1. Discuss the importance of sustainable land management practices in Ukraine.
2. Discuss the potential ways in which technology and innovation can further improve land management practices in Ukraine.
3. Discuss the role of community engagement and stakeholder involvement in shaping successful land management policies and initiatives.

## Unit 6. Satellite geodesy in the USA

**Exercise I. Read and learn new words:**

| | |
|---|---|
| feature | /ˈfiː-chər/ |
| precisely | /priˈsaɪsli/ |
| Earth | /ɜːrθ/ |
| planet | /ˈplænɪt/ |
| protect | /prəˈtekt/ |

**Exercise II. Read and translate the text:**

We suppose that satellite geodesy in the USA is a very important part of understanding Earth's features using satellites. First of all, it helps with many things in the country. Generally, the United States uses satellites to measure and watch Earth's movements and changes. Secondly, the main satellite system used is called the Global Positioning System, or GPS. Importantly, GPS helps people find their way and tells them where they are on Earth. Undoubtedly, it is used in many things like cars, phones, and airplanes. We are convinced, that other countries have their own contemporary satellite systems too. By the way, these satellites work together to make sure we get accurate information about Earth. On the one hand, with Satellite geodesy, we can measure things very precisely, like how high the oceans are and how fast they move. Besides, Satellite geodesy also helps us study the land, like mountains, forests, and cities. On the other hand, the National Geodetic Survey is a part of the United States government that helps manage all the geodesy data. It makes sure that the data is correct and useful for everyone. People in the USA work together

to make satellite geodesy better and learn more about Earth. After all, it's important because it helps us understand and protect our planet.

**Exercise III. Choose the correct answer:**

1.What is satellite geodesy?

a) Studying stars,

b) Understanding Earth's features using satellites,

c) Exploring underwater ecosystems,

d) Investigating lunar surfaces

2. The main satellite system used in the USA for geodesy

is called _____

a) NGS,

b) GIS,

c) GPS,

d) RTK.

3. The main purpose of satellite geodesy in the USA is to:

a) control the weather

b) improve cell phone reception,

c) understand Earth's features using satellites,

d) provide internet access to remote areas.

4. Which of the following is NOT listed as a way satellite geodesy is used in the USA?

a) Studying the land

b) Measuring ocean heights

c) Tracking wildlife migration

d) Improving car fuel efficiency.

5. The National Geodetic Survey is responsible for:

a) launching new satellites,

b) managing all the geodesy data,

c) building new roads and bridges,

d) developing new phone apps.

**Exercise IV. Answer the following questions:**

1. What does "geodesy" refer to in the context of the text?
2. What is the name of the main satellite system used in the USA for satellite geodesy?
3. What are some other examples of how GPS is used?
4. What other countries have their own satellite systems?
5. What does the National Geodetic Survey do?
6. How does satellite geodesy help us protect our planet?
7. Why is satellite geodesy important for the USA?

**Exercise V. Translate into Ukrainian:**

1. The land cadastre plays a crucial role in the United States, serving as a comprehensive record of land ownership and boundaries.

2. While the primary responsibility for managing land records falls to individual states and counties, the US government plays a significant yet multifaceted role in supporting and influencing the national cadastre landscape.

3. The US government is responsible for the surveying, mapping, and management of approximately 640 million acres of federal lands.

**Exercise VI. True or false:**

1. GPS is only used for military purposes.
2. Satellite geodesy only studies land features like mountains and forests.
3. The main goal of satellite geodesy in the USA is to track animals.
4. The USA is the only country with its own satellite system for geodesy.
5. Satellite geodesy helps measure the height of mountains and forests.

## Unit 7. Writing the abstract

**Exercise I. Give Ukrainian equivalents of the following words and word combinations:**

Abstract, purpose, research, logical transitions, unnecessary details, key components, coherently, the research objectives, to convey, immediacy and clarity.

**Exercise II. Read and translate the text:**

### Writing the abstract

Have you ever been to a conference where people present their research? On the whole, they often start with a short summary called an abstract.

Personally, we think that to write an effective abstract in English, follow these steps:

Firstly, Understand the Purpose: Before writing the abstract, understand its purpose.

Secondly, An abstract should provide a clear and concise summary of your research, helping readers quickly determine if the paper is relevant to their interests.

Thirdly, Identify Key Components: Identify the key components of your research that need to be included in the abstract. These typically include the research objectives, methodology, results, and conclusions.

To me, you must be Concise: Keep the abstract concise and to the point. Aim for clarity and brevity, using clear and straightforward language to convey your ideas.

By the way, Use Active Voice: Write in the active voice to make the abstract more engaging and direct. This helps convey a sense of immediacy and clarity.

Include Relevant Keywords: Include relevant keywords in the abstract to help readers find your research in databases and search engines. Choose keywords that accurately reflect the content and focus of your study.

Write Clearly and Coherently: Ensure that your abstract is written clearly and coherently. Use logical transitions between sentences and paragraphs to guide the reader through the summary of your research.

Avoid Unnecessary Details: Avoid including unnecessary details or background information in the abstract. Focus on summarizing the most important aspects of your research.

**Exercise III. Retell the text and make up 5 questions to this text.**

**Exercise IV. Discuss the following points:**

1. Briefly explain what your research is about.
2. List the reasons for doing research in geodesy.
3. How do you do your research? Do you use experiments, surveys, or another method?
4. Explain why your research is interesting and important to others.

**Exercise V. Choose the best answer for each question:**

1. What is the primary purpose of writing an abstract in English?

a) To provide background information about the research.

b) To summarize the key points of the research paper.

c) To present detailed findings and analysis.

d) To tell a funny story about your research topic

2. What should be included in the title of your abstract?

a) A long and complicated sentence.

b) A short and catchy phrase related to your topic.

c) Your full name and address.

d) A list of references used in your presentation.

3. What is the overall tone of an abstract written for the scientific audience?

a) Formal and technical language.

b) Simple and clear language

c) Informal Language with slang

d) Language with background information

**Exercise VI. Read the statements and decide whether they are true or false.**

1. Before writing the abstract, understand its purpose.
2. Identify the key components of your research.
3. The title of your abstract should be long, related to your research topic.
4. It's important to use complex vocabulary and advanced sentence structures.
5. A good abstract should briefly explain your research methods and key findings.

## Unit 8. Participating in a conference

**Exercise I. Give Ukrainian equivalents of the following words and word combinations:**

Share insights, an enriching experience, review, keynote speakers, session topics, to identify, align, to secure your spot, registration discounts, handouts, to ensure, take advantage, deliver, confidently.

**Exercise II. Read and translate the text:**

### Participating in a conference

Participating in a conference can be an enriching experience, providing opportunities to network, learn, and share insights with others in your field. Here are some recommendations for making the most of your conference experience:

Plan Ahead: Before the conference, review the schedule, keynote speakers, and session topics to identify which sessions align with your interests and goals.

Register Early: Register for the conference as soon as possible to secure your spot and take advantage of early registration discounts.

Prepare Your Materials: If you're presenting at the conference, prepare your presentation slides, handouts, and any other materials well in advance.

Practice Your Presentation: Practice your presentation several times to ensure you're comfortable with the content and can deliver it confidently.

**Exercise III. Put up questions to the underlined words:**

1. I selected a conference relevant to my research interests and career goals.
2. Most conferences require submission of an abstract.
3. I will attend poster sessions and social events to connect with other researchers and professionals in my field.

**Exercise IV. Translate into English:**

Заключне слово, жвавий диспут, плідна дискусія, промовити слово, тези, відомі доповідачі, реєстрація, організаційний внесок, збірник тез.

**Exercise V. You are going to participate in the scientific conference "AI in Geodesy in the XXI century". Prepare a presentation (15 slides) . Prepare the abstract for this conference (15-20 sentences).**

## Unit 9. The Scientific Article

**Exercise I. Read and learn new words:**

Scientific, gap, the data collection process, hypothesis, to grasp, key terms, observations, significance.

**Exercise II. Read and translate the text:**

### The Scientific Article

A typical scientific article follows a specific structure, often referred to as "IMRAD":

- **Introduction:** This section sets the stage by introducing the research topic, providing background information, and highlighting the existing knowledge gap. It also states the research question or hypothesis.
- **Methods:** This section describes the procedures and techniques used to conduct the research. It outlines the materials used, the data collection process, and the analysis methods employed.
- **Results:** This section presents the findings of the research. It uses tables, figures, and text to describe the data collected and the key observations made.

- **Discussion:** This section interprets the results, explains their significance in the context of existing knowledge, and addresses any limitations of the study. It may also propose future research directions.
- **Conclusion:** This section summarizes the main findings and reiterates the research's contribution to the field.

**There are some tips for writing the scientific article:**

- **Start with the abstract:** The abstract is a concise summary of the entire article, often located at the beginning. It can help you decide if the article is relevant to your interests.
- **Pay attention to the keywords:** Key terms and phrases are often provided at the beginning of the article. These highlight the core themes and can be helpful for understanding the overall research focus.
- **Focus on the figures and tables:** Visual representations of data can be easier to understand than text-heavy sections. Use them to grasp the key findings and trends.
- **Don't be afraid to consult a dictionary:** Scientific articles may use specialized vocabulary. Look up unfamiliar terms in a dictionary or search online for definitions.
- **Read critically:** Don't simply accept everything presented as fact. Ask yourself questions about the research methodology, potential biases, and the validity of the conclusions.

**Exercise III. Answer the following questions:**

1. What is the main purpose of a scientific article?
2. What does the acronym "IMRAD" stand for in the context of a scientific article?
3. What key information is typically found in the "introduction" section of a scientific article?
4. What is the purpose of the "methods" section in a scientific article?
5. How can figures and tables be helpful when reading a scientific article?
6. What is the difference between an abstract and a conclusion in a scientific article?

7. According to the text, what are some strategies to overcome the initial challenges of reading a scientific article?
8. Why is it important to critically read a scientific article?
9. What message does the text convey about the accessibility of scientific knowledge?
10. In your own words, explain the main steps involved in "demystifying" and understanding a scientific article.

## Unit 10. Understanding terminology in geodesy

**Exercise I.: Give Ukrainian equivalents of the following words and word combinations:**

A triangle, to approximate, a reference point, the basis for geodetic measurements, surface features, navigation system, satellite-based navigation system.

**Exercise II. Read and translate the text:**

### Understanding terminology in geodesy

Understanding terminology in geodesy is essential for grasping the fundamentals of this field. Geodesy involves the study of Earth's shape, size, and gravitational field, as well as the measurement and representation of its surface features. Here are some key terms in geodesy:

Geoid: The theoretical shape of Earth's surface that closely corresponds to mean sea level.

Ellipsoid: A mathematical representation of Earth's shape, approximating it as an oblate spheroid.

Datum: A reference point or surface used as the basis for geodetic measurements and calculations.

Latitude: The angular distance north or south of the equator, measured in degrees.

Longitude: The angular distance east or west of the prime meridian, measured in degrees.

Altitude: The height of a point above a reference surface, such as mean sea level.

Orthometric Height: The height of a point above a reference ellipsoid or geoid.

Geodetic Survey: The process of measuring and mapping Earth's surface features, including its shape and topography.

GPS (Global Positioning System): A satellite-based navigation system that provides location and time information anywhere on Earth.

GNSS (Global Navigation Satellite System): A generic term for satellite navigation systems like GPS, GLONASS, Galileo, and BeiDou.

Cadastral Survey: The surveying and mapping of land boundaries, ownership, and property rights.

Triangulation: A method of determining distances and angles by measuring from known points in a triangle.

Topography: The study and representation of Earth's surface features, including hills, valleys, and terrain.

Gravity: The force that attracts objects toward the center of Earth, influencing geodetic measurements.

Satellite Altimetry: The measurement of the height of Earth's surface features, such as oceans and ice caps, using satellite-based radar or laser systems.

Understanding these basic terms is foundational for anyone interested in geodesy and related fields. They provide the vocabulary necessary for discussing and learning about Earth's shape, measurements, and geographic features.

**Exercise III. Retell the text and make up 5 questions to this text.**

**Exercise IV. Write the negative form of the words :**

Effective, use, useful, helpful, correct, available, comfortable, pack.

**Exercise V. Translate into Ukrainian:**

1. Triangulation is a method of determining distances and angles by measuring from known points in a triangle.

2. GPS is important in geodesy because it provides accurate location and time information anywhere on Earth, aiding in measurements and navigation.

3. Latitude measures the angular distance north or south of the equator, while longitude measures the angular distance east or west of the prime meridian.

## SUPPLEMENT 1

**Латинські терміни, які зустрічаються в науково-технічної літературі.**

| | |
|---|---|
| **ab init** (abinitio) **–** з початку | **seg. (sequens) –** наступний |
| **ad fin** (ad finitum**) –** до кінця | **sv (sub voce) –** під цим заголовком |
| **ad inf** (ad infinitum**) –** до безкінечності | **us, ut sup. (ut supra) –** як зазначено вище |
| **ad int (**ad interim**) –** тим часом | **v (versus) -** проти |
| **ad hoc –** для даного випадку | **vid. (vide) –** дивися |
| **ad libitum -** | **v** (volume) – том |
| **e.g (**exempli gratia**) –** наприклад | **viz** (videlicet) - а саме |
| **et al.** (at alii) – та інші | **vo (verso) –** з іншої сторони |
| **etc.** (et cetera) – і так далі | **vs (versus) –** проти |
| **fig. –** малюнок | **contra –** проти |
| **i.e.** (id est) **–** тобто | **de factor –** фактично |
| **ib., ibid** (ibidem) **–** там же | **in toto –** повністю |
| **id.** (idem) – теж видання | **l. c. (locus citatus) –** цитоване місце |
| **in loc. cit. (**in loco citato) – у цитованій праці | **pro et contra –** за і проти |
| **iq. (**idem qiod) – теж саме | **verbatim –** дослівно, буквально |
| **lb** (libra) – фунт | **vice versa –** навпаки |
| **lc (**loco citato**) –** цитоване місце | **in brevi –**коротко, лаконічно |
| **NB (**nota bene) – зауважте | **eo ipso –** внаслідок цього |
| **PS** (post scriptum) – післяслів | **ergo –**отже |
| **sc (scilicet) –** а саме | **ex parte –** неповно, однобічно |

## SUPPLEMENT 2

## Reading of different symbols

$m^2$ - square meter

$m^3$ - cubic meter

m/s – meter per second

$m/s^2$ - meter per second squared

$s^{-2}$ - second to the minus 2nd power

rad/s – radian per second

Hz – hertz

$kg/m^3$ - kilogram per cubic meter

$m^3$- meter to the third power

kg ·m / s – kilogram-meter per second

kg ·$m^2$ / s – kilogram-squared meter per second

$N/m^3$ - newton per cubic meter

Pa – pascal

J – joule

W – watt

Kg/(s· m ·Pa) – kilogram per second meter pascal

% - per cent

‰ – parts per thousand (промилле)

ppm – parts per million (миллионная доля)

$tf \cdot s^2/m^3$ - tonne-force-squared second per meter to the 3d power

kg/(h· m · mm H2O) – kilogram per hour-meter-millimeter of water

g / (h· m · mm Hg) – gram per hour-meter-millimeter of mercury

kcal /kg – kilocalorie per kilogram

## SUPPLEMENT 3

## Prefixes in English

| | | |
|---|---|---|
| possible | **Im-**possible | opposite |
| payment | **non**-payment | negation |
| war | **pre**-war | time (before) |
| biography | **auto-**biography | self, same |
| worker | **co**-worker | with, together |
| appear | **dis-**appear | not, apart, away |
| economics | **macro-**economics | large, prominent |
| elect | **re**-elect | again |

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