

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
Національний університет кораблебудування
імені адмірала Макарова

С. В. Кириченко

МЕТОДИЧНІ РЕКОМЕНДАЦІЇ

**до курсу «Практикум з іншомовного наукового
спілкування (англійська мова)»
для магістрів спеціальності
«F4 Системний аналіз та наука про дані»**

Рекомендовано Методичною радою НУК



ВИДАВНИЦТВО
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Рекомендовано Методичною радою НУК

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К43 Методичні рекомендації до курсу «Практикум з іншомовного наукового спілкування (англійська мова)» для магістрів спеціальності «F4 Системний аналіз та наука про дані» / С. В. Кириченко. – Миколаїв : НУК, 2026. – 72 с.

Представлено тематику занять, практичні завдання, лексико-граматичний супровід, а також поради з розвитку академічного письма, усного мовлення та підготовки до участі в наукових конференціях і написання наукових робіт англійською мовою.

Рекомендації укладено для методичного забезпечення дисципліни «Практикум з іншомовного наукового спілкування (англійська мова)».

Призначено для здобувачів другого (магістерського) рівня вищої освіти галузі знань «F Інформаційні технології», спеціальності «F4 Системний аналіз та наука про дані», освітньої програми «Інтелектуальний аналіз даних та проектування програмних систем».

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ПЕРЕДМОВА

У сучасному науково-освітньому просторі знання англійської мови як мови міжнародної наукової комунікації є необхідною складовою підготовки фахівців ІТ-сфери. Здобувачі магістерського рівня мають бути здатними презентувати результати власних досліджень, писати наукові статті, брати участь у міжнародних конференціях та ефективно комунікувати з іноземними колегами.

Дані методичні рекомендації спрямовані на розвиток іншомовної академічної компетентності майбутніх фахівців з системного аналізу та науки про дані. Вони містять завдання для опрацювання лексики наукового стилю, тренування академічних навичок мовлення та письма, а також формування навичок представлення наукової інформації з використанням сучасних засобів візуалізації.

Методичні рекомендації будуть корисними як викладачам, так і здобувачам освіти при підготовці до практичних занять, індивідуальної роботи та виступів на наукових заходах.

UNIT 1

APPLICATIONS AND APPLICATION FORMS

What is an Application?

An **application** is a formal written request to be considered for something – for example, admission to a university, participation in a research project, internship, scholarship, or a job. Applications must be clear, concise, and follow a formal style.

For students of System Analysis, applications may be required in the following contexts:

- Applying for research internships (e.g., in data analytics or AI labs);
- Participating in academic mobility or Erasmus+ programs;
- Requesting access to scientific databases or software;
- Submitting project proposals or funding requests.

Key Elements of an Application Letter

A formal application usually includes:

1. **Header** (optional if email is used): your name and contact details.
2. **Date**
3. **Recipient's contact information** (institution, name if known).
4. **Greeting** (e.g., *Dear Sir or Madam*, *Dear Committee*, *Dear Dr. Smith*).
5. **Opening paragraph** – state your purpose (e.g., “I am writing to apply for...”).
6. **Body paragraph(s)** – provide relevant background, qualifications, and motivation.

7. **Closing paragraph** – express willingness for further communication.
8. **Formal closing** (e.g., *Sincerely*, *Best regards*) and your full name.

Sample Application Letter (for a Research Internship)

To: researchlab@unitech.edu

Subject: Application for Summer Research Internship

June 4, 2025

Dear Dr. Anderson,

I am writing to express my interest in the Summer Research Internship Program at your Department of Artificial Intelligence. I am currently pursuing a Master's degree in System Analysis at [Your University Name], and I am eager to apply my skills in data modeling, systems thinking, and algorithmic analysis in a real-world research setting.

My academic background includes coursework in machine learning, optimization methods, and decision support systems. I have hands-on experience with Python, MATLAB, and SQL, as well as team-based project work in developing predictive models.

I believe this internship would greatly enhance my academic and professional development, and I would be grateful for the opportunity to contribute to your ongoing projects. Please find my CV attached.

Thank you for considering my application.

Sincerely,

Oleksandr Kovalenko

Master's Student, System Analysis

oleksandr.kovalenko.sa@univ.edu

+38 (063) 123-45-67

Application Forms

An **application form** is a standardized document with fields to fill in, often used for online submissions. It's important to:

- Use **clear and formal language**;
- Avoid contractions (write *do not* instead of *don't*);
- Use complete sentences where required (e.g., “Describe your motivation”).

Sample Application Form Template

APPLICATION FORM

Full Name:	Ivan Petrenko
Email:	ivan.petrenko@unitech.edu.ua
Phone Number:	+380 67 123 45 67
Current Degree Program:	Master's in System Analysis
University Name:	National Technical University of Ukraine
Title of Request:	Application for Erasmus+ Exchange Program
Motivation (max. 150 words):	I am eager to take part in the Erasmus+ program because it offers an excellent opportunity to enhance my academic experience and cultural awareness. My main academic interests are in system modeling, data analysis, and applied artificial intelligence. Participating in this exchange will allow me to collaborate with international peers and improve my skills in a multicultural environment.
Signature (typed):	Ivan Petrenko
Date:	02 June 2025

Practice Task 1. Write a formal application letter (120–150 words) to apply for:

- Participation in a student research conference in Vienna;
- Access to a closed online database for your Master's thesis;
- A scholarship for excellence in data science.

Use the structure and language outlined above.

Practice Task 2. Fix the Mistakes

Below is a draft of an application letter with common stylistic and grammatical errors. Find and correct at least 6 mistakes:

Dear Sir/Madam,

I'm writing because I want to take part in the internship program at your university. I'm master student at National Technical University. I interested in AI and systems modeling.

I have experience in Python, SQL and worked in a group project about data analysis. Hope you will consider my application.

Best,

Ivan

Practice Task 3: Apply for access to a closed scientific dataset for your Master's thesis on decision support systems in healthcare.

UNIT 2

ACADEMIC COURSES

This section introduces students to the English vocabulary, structures, and communication strategies needed to describe and discuss their academic background, coursework, and specialisation in System Analysis in an international academic environment.

Vocabulary

Ukrainian	English
Системний аналіз складних процесів	System Analysis of Complex Processes
Теорія прийняття рішень	Decision-Making Theory
Матичне моделювання	Mathematical Modelling
Інтелектуальні інформаційні системи	Intelligent Information Systems
Методи оптимізації	Optimization Methods
Обробка великих даних	Big Data Processing
Машинне навчання	Machine Learning
Теорія ігор	Game Theory
Інформаційна безпека	Information Security
Прогнозування соціально-економічних процесів	Forecasting of Socio-Economic Processes

Useful phrases:

- I am currently pursuing a Master's degree in System Analysis.
- My major subjects include... / I specialize in...
- One of the core courses I study is...
- This course focuses on...
- It provides practical/theoretical knowledge in...
- The course helps us develop skills in...

Example:

I am currently pursuing a Master's degree in System Analysis. My academic courses cover both theoretical and applied aspects of the field. For example, the course Optimization Methods focuses on solving complex systems problems through mathematical techniques. Another key subject is Big Data Processing, where we work with tools like Python and R to analyze large datasets.

Practice Task 1: Write a short paragraph (5–6 sentences) about your academic courses and explain how they are relevant to your future career or research interests.

Practice Task 2: Match the course names in English with their correct descriptions:

Course Name	Description
Machine Learning	A subject dealing with protecting information systems from unauthorized access.
Game Theory	A course about algorithms that improve automatically through experience.
Optimization Methods	A subject that studies mathematical models of strategic interaction..
Information Security	A course focused on techniques to find the best solution among many options

Practice Task 3: Dialogue Practice. Talk about your academic courses using the model below

Sample Dialogue:

Student A: What courses are you taking this semester?

Student B: I'm taking Optimization Methods, Machine Learning, and Big Data Processing.

Student A: That sounds interesting. What's your favorite one?

Student B: Probably Optimization Methods. It's challenging but very practical. We learn how to solve real-world problems using mathematical tools.

Student A: Do you work on any projects in that course?

Student B: Yes, we're developing a model to optimize delivery routes using linear programming.

Practice Task 4: Work in pairs. Interview each other using the questions below. Then, introduce your partner to the class based on the information you learned.

Questions to ask your partner:

1. What's your field of study?
2. What are your main academic courses this year?
3. Which course do you find the most useful? Why?
4. Is there a course that you find especially difficult? Explain.
5. How do your courses relate to your future career goals?

Example Presentation (after interview):

Let me introduce my partner, Olena. She is studying for a Master's degree in System Analysis. This year, she is taking courses such as Mathematical Modelling, Game Theory, and Information Security. Her favorite subject is Game Theory because it helps her understand strategic decision-making. She finds Information Security the most difficult but also the most relevant to her future career in IT consulting.

UNIT 3

STUDY HABITS AND SKILLS

This section aims to develop students' ability to discuss and reflect on their study habits, time management, and learning strategies in English. For Master's students in System Analysis, these skills are essential for succeeding in both academic and professional contexts.

Vocabulary

Ukrainian	English
Навички навчання	Study skills
Уміння керувати часом	Time management
Самостійне навчання	Independent learning
Глибоке розуміння	Deep understanding
Засвоєння матеріалу	Knowledge retention
Планування	Scheduling
Рефлексія	Reflection
Критичне мислення	Critical thinking
Звичка	Habit
Відволікання	Distraction

Useful Phrases

- I usually study best in the morning/at night.
- I make weekly schedules to manage my time effectively.
- I use mind maps and visual aids to understand complex systems.
- I prefer studying alone/in a group.

- I revise my notes regularly to retain information.
- I sometimes struggle with procrastination and distractions.
- Time management is crucial for handling multiple projects.

Practice Task 1: In pairs or small groups, discuss the following:

1. What study methods work best for you when preparing for technical exams?
2. How do you balance practical projects with theoretical coursework?
3. What tools (apps, planners, techniques) help you stay organized?
4. Do you prefer learning from lectures, books, videos, or hands-on tasks? Why?

Practice Task 2: Write a short paragraph (5–6 sentences) about your study habits.

Use at least **three** of the phrases from the section above.

Example:

As a Master's student in System Analysis, I try to study consistently every day. I usually review my lecture notes in the evening and work on group projects during weekends. To manage my time effectively, I use digital planners and set short-term goals. I prefer studying alone, especially when dealing with programming tasks. However, for math-heavy subjects, group discussions really help me clarify concepts.

Practice Task 3: Pair Work. Interview your partner using the questions below and present their answers to the group.

Questions:

- What is your typical daily study routine?
- How do you prepare for exams or presentations?
- What distracts you most when studying?
- Do you take breaks while studying? How often?
- What would you like to improve about your study habits?

Example Report:

My partner, Dmytro, prefers to study late at night when it's quiet. He usually revises with summary notes and practices problems from previous exams. He struggles with staying focused for long hours and often uses the Pomodoro method to take breaks. He would like to improve his time management and start assignments earlier.

Practice Task 4: Read the following text and complete the tasks below.

Effective Study Strategies for STEM Students

STEM students, especially those in fields like System Analysis, need a structured and analytical approach to learning. Passive reading or memorization is rarely enough. One key strategy is **active recall** – the process of testing yourself on what you've learned rather than re-reading notes. Another useful method is **spaced repetition**, where you review information over increasing intervals of time to help long-term retention.

Visual learning tools such as diagrams, flowcharts, and graphs are especially effective for understanding algorithms, data structures, and system models. Group study sessions can help clarify complex concepts, but it's important to combine them with individual study time.

Time management tools, like calendars, to-do lists, and study timers, are crucial. Breaking large tasks into smaller steps helps reduce stress and increase motivation. Finally, taking regular breaks, exercising, and maintaining a healthy sleep schedule support brain function and academic performance.

Practice Task 5: Match the terms to their definitions:

Term	Definition
1. Active recall	A. Reviewing material with longer and longer intervals
2. Spaced repetition	B. Drawing or using diagrams to understand material

- | | |
|--------------------|---|
| 3. Visual learning | C. Testing yourself on the information rather than re-reading notes |
| 4. Time management | D. Planning how to use your hours efficiently |

Practice Task 6: Answer in 1–2 sentences:

1. Why is passive reading not effective for STEM students?
2. What are the benefits of visual learning tools?
3. How can breaking large tasks into smaller steps help?

Practice Task 7: Discuss with a partner. Which of these strategies do you already use? Which one would you like to try? Why?

UNIT 4

ONLINE LEARNING.

PARTICIPATING IN SCIENTIFIC CONFERENCES

In the modern academic environment, especially for Master's students in System Analysis, online learning and active participation in scientific conferences are essential components of professional growth. This section provides useful vocabulary, phrases, and practical advice to help students effectively engage in virtual learning and scholarly events.

Vocabulary

Ukrainian	English
Онлайн-навчання	Online learning
Вебінар	Webinar
Віртуальна аудиторія	Virtual classroom
Відеоконференція	Video conference
Запис лекції	Lecture recording
Віддалений доступ	Remote access
Інтерактивні завдання	Interactive tasks
Платформа для навчання	Learning platform
Технічні проблеми	Technical issues
Наукова конференція	Scientific conference
Доповідь	Presentation
Секція	Session
Постерна презентація	Poster presentation

Питання та відповіді	Q&A (Questions and Answers)
Модератор	Moderator
Віртуальна конференція	Virtual conference
Наукове співтовариство	Academic community

Useful Phrases

For Online Learning:

- I attend lectures and seminars online using platforms like Zoom and Microsoft Teams.
- Sometimes I watch recorded lectures if I miss the live session.
- Online learning requires good time management and self-discipline.
- I participate actively in discussion forums and group chats.
- Technical issues, such as poor internet connection, can disrupt the learning process.
- Interactive tasks help me understand the material better.

For Scientific Conferences:

- I am preparing a presentation on my recent research project.
- During the conference, I plan to attend sessions related to system optimization and data analysis.
- Asking questions after presentations helps deepen understanding and engage with experts.
- Networking with other researchers is important for future collaborations.
- Virtual conferences allow participation from anywhere in the world.
- Poster presentations are a great way to showcase preliminary results.

For Online Learning:

- Create a quiet, organized study space free from distractions.
- Test your technical equipment before each session.

- Keep a schedule to stay on track with assignments and deadlines.
- Actively participate in chats and forums to enhance understanding.
- Take notes during live or recorded lectures for later review.

For Scientific Conferences:

- Prepare your presentation well in advance and practice delivering it clearly and confidently.
- Review the conference agenda and select sessions that match your interests.
- Prepare questions to ask presenters to foster discussion.
- Use breaks to network with other participants, even virtually.
- Follow up with contacts after the conference to maintain professional relationships.

Practice Task 1: Write a short formal email in English to register for an upcoming virtual scientific conference on System Analysis.

Example:

Subject: Registration for the International Conference on System Analysis 2025

Dear Organizing Committee,

I would like to register for the International Conference on System Analysis, scheduled for July 10–12, 2025. I am a Master’s student specializing in System Analysis at [University Name]. Please provide me with the registration details and any necessary instructions.

Thank you for your assistance.

Best regards,

[Your Name]

[Your Contact Information]

Practice Task 2: Make a dialogue following the example below.
Dialogue Example

Context: Two students discuss their experience with online learning and upcoming scientific conferences.

Anna: Hi, Mark! Are you ready for the online seminar on system optimization next week?

Mark: Hi, Anna! Yes, I registered yesterday. I'm a bit nervous because it's my first time presenting virtually.

Anna: Don't worry! Just make sure your internet connection is stable and practice your presentation several times.

Mark: Thanks for the advice! How do you usually prepare for online lectures?

Anna: I create a study schedule and take detailed notes during the live sessions. If I miss anything, I watch the recordings later.

Mark: That sounds effective. Are you planning to attend any other conferences this year?

Anna: Yes, I'm also submitting an abstract for the international conference in September. It will be virtual too.

Mark: Great! Maybe we can join the Q&A sessions together and discuss the presentations afterwards.

Practice Task 3: Prepare a 5-minute presentation in English on one of the following topics related to System Analysis:

- Recent trends in data analytics and their applications
- The role of system modeling in solving complex problems
- Challenges and solutions in implementing distributed systems
- The impact of machine learning on system optimization

Guidelines:

- Start with a brief introduction of the topic.
- Present 3–4 key points with examples or data.
- Use simple and clear language suitable for an academic audience.
- End with a short conclusion summarizing the main ideas.
- Prepare 1–2 slides to support your talk (optional).
- Be ready to answer 1–2 questions from your peers or instructor.

UNIT 5

WAYS OF TALKING ABOUT SOURCES, FACTS, EVIDENCE, AND DATA. NUMBERS AND STATISTICS IN RESEARCH

For master's students specializing in System Analysis, it is important to be able to express clearly and accurately information used in research, as well as to present numerical data and statistics correctly. This section will help you master key expressions, structures, and terminology for academic speaking and writing.

1. Talking about Sources
 - According to [Author's Name] (2022), ...
 - [Author's Name] argues that ...
 - A recent study by [Author] shows ...
 - Research conducted by [Institution/Author] indicates ...
 - As reported in the article/book ...
 - Based on the findings of ...
 - The data were collected from ...
 - The primary source of information is ...
2. Referring to Facts, Evidence, and Data
 - The evidence suggests that ...
 - It is a well-known fact that ...
 - Empirical data show ...
 - The results confirm that ...
 - There is strong evidence supporting ...
 - The findings demonstrate a correlation between ...
 - Statistical analysis reveals ...
 - According to the data presented, ...

3. Presenting Numbers and Statistics

English phrase	Explanation / Example
The percentage of ... is ...	The percentage of system failures is 12 %.
The majority/minority of participants ...	The majority of users prefer automated systems.
On average, ...	On average, the algorithm reduces processing time by 30 %.
There was a significant increase/decrease	There was a significant increase in data throughput in 2023.
The sample size consisted of ...	The sample size consisted of 150 system administrators.
The correlation coefficient was ...	The correlation coefficient between variables X and Y was 0.85.
Data indicate/trend towards ...	Data indicate a trend towards increased use of cloud computing.
According to the latest statistics, ...	According to the latest statistics, network downtime decreased by 5 %.

4. Expressing Uncertainty or Limitations

- The data suggest, but do not conclusively prove, that ...
- It appears that ... however, further research is needed.
- The evidence is inconclusive regarding ...
- These results should be interpreted with caution because ...
- There is limited data on ...
- The findings are based on a small sample size.

5. Tips for Using Numbers in Research Writing

- Always provide context for numbers: explain what they represent and why they matter.

- Use precise terms such as “percentage,” “rate,” “average,” and “correlation.”
 - Avoid vague phrases like “a lot” or “some.”
 - When presenting statistics, mention the source and date if possible.
 - Use visuals (charts, tables) to support complex numerical data when appropriate.
6. Recommendations
- Practice regularly by creating your own sentences using key expressions.
 - Use academic sources for examples and citations.
 - Read scientific articles in your field, paying attention to language structures used for describing data.
 - Apply learned phrases in your presentations and written assignments to improve the academic quality of your work.

Practice Task 1: Rewrite the following sentences using academic phrases introduced above:

1. “The study shows that most users like the new system.”
2. “The number of errors went down by 20% last year.”
3. “Scientists say there might be a connection between two variables.”
4. “The information came from a survey of 200 people.”
5. “We don’t have enough data to be sure about this result.”

Practice Task 2: Paraphrase the sentences using the academic expressions from the previous section:

1. “A study by Smith shows that computer systems fail less often when regularly updated.”
2. “Most respondents preferred the new software.”
3. “The number of users increased by 15% in the last quarter.”
4. “The research is not fully clear on whether this method is always effective.”
5. “The data was collected from 300 participants.”

Practice Task 3: Fill-in-the-Blank Exercise

Complete the sentences with the appropriate expressions:

1. _____ (According to / The evidence suggests that) automated monitoring improves system reliability.
2. The correlation coefficient between load and response time _____ (was found to be / indicates) 0.78.
3. The sample size _____ (consisted of / was) 250 system analysts.
4. _____ (The findings demonstrate / There is limited data) a strong link between user satisfaction and software updates.
5. The data _____ (show / are inconclusive) that cloud storage adoption is increasing.

Practice Task 4: Write a short paragraph (4–5 sentences) about research results using academic phrases.

Example:

According to the recent study by Johnson et al. (2023), there is a significant increase in the use of machine learning algorithms in system analysis. The data indicate that the majority of companies adopting these technologies report improved efficiency. The correlation coefficient between algorithm complexity and processing speed was found to be -0.65, suggesting that simpler algorithms perform faster. However, the evidence is inconclusive regarding long-term effects on system stability. Further research with larger samples is necessary to confirm these findings.

UNIT 6

IMAGE, IMPACT AND MAKING AN IMPRESSION. GRAPHS AND DIAGRAMS

For master's students in System Analysis, effectively presenting data visually is a key component of academic communication. Whether in written reports, conference presentations, or research articles, the ability to use **graphs, charts, and diagrams** enhances both clarity and impact. Visual tools help summarize complex information, highlight trends, and support arguments based on evidence.

Key Objectives of This Section:

- Learn how to describe and interpret visual data clearly.
 - Understand the types of graphs and diagrams commonly used in scientific research.
 - Acquire language and expressions for emphasizing key findings.
 - Practice integrating visuals into presentations and written work effectively.
1. Common Types of Visuals
 - **Line graph** – used to show changes over time
 - **Bar chart** – compares quantities across categories
 - **Pie chart** – shows proportions or percentages of a whole
 - **Flowchart** – outlines a process or system structure
 - **Scatter plot** – illustrates relationships or correlations between variables
 - **Venn diagram** – compares and contrasts sets or ideas
 2. Useful Phrases for Describing Visuals
 - *The graph illustrates...*
 - *As shown in the chart,...*

- *The diagram demonstrates the process of...*
- *According to the figure,...*
- *A sharp increase/decrease is observed in...*
- *There is a clear correlation between...*
- *The data suggest that...*

3. Creating an Impact with Visuals

When using graphs or diagrams:

- Choose the **most appropriate format** for your data.
- Label all axes, categories, and units **clearly**.
- Keep the design **simple and readable**.
- Highlight key trends using **color or annotations**.
- Refer to visuals directly in your presentation or writing using precise academic language.

Practice Task 1: Study the provided line graph on system response times. Write 3–4 sentences describing the trends you observe.

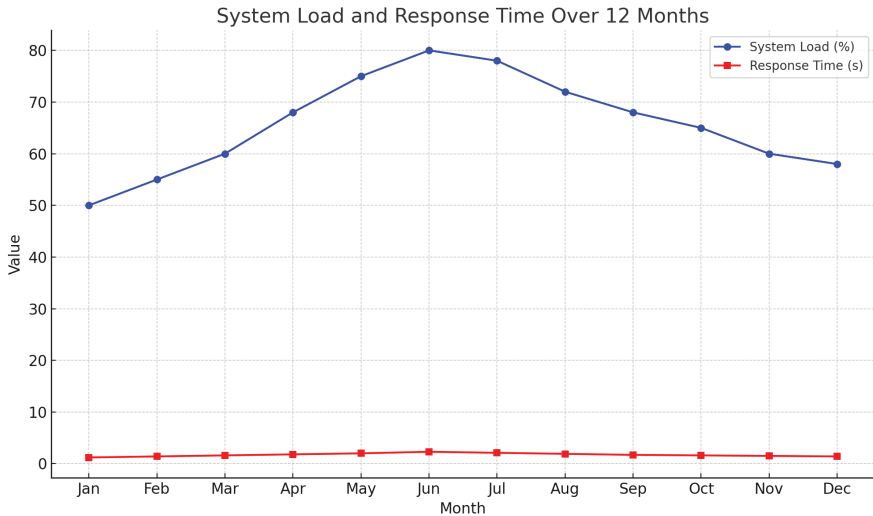
Practice Task 2: Create a bar chart comparing the number of users for different software platforms. Present your findings in a short paragraph using appropriate academic phrases.

Practice Task 3: Choose a dataset relevant to your field and visualize it using a pie chart or flowchart. Write a brief description (approx. 100 words) explaining its purpose and implications.

Final Tip: Strong visual communication strengthens your academic voice. Practice describing data both verbally and in writing, and remember: **clear visuals make a strong impression**.

Practice Task 4: Practice describing and interpreting visual data (graphs, charts, flowcharts) in clear, academic English relevant to your field.

1. Line Graph – System Performance Over Time



Instructions: Study a line graph that shows system load vs. average response time over 12 months. Describe the trends and changes in the graph in 3–4 sentences. Use appropriate vocabulary: *increase, stabilize, decline, peak, drop, rise, significantly, slightly, etc.*

Example start: The line graph illustrates the relationship between system load and average response time over a one-year period...

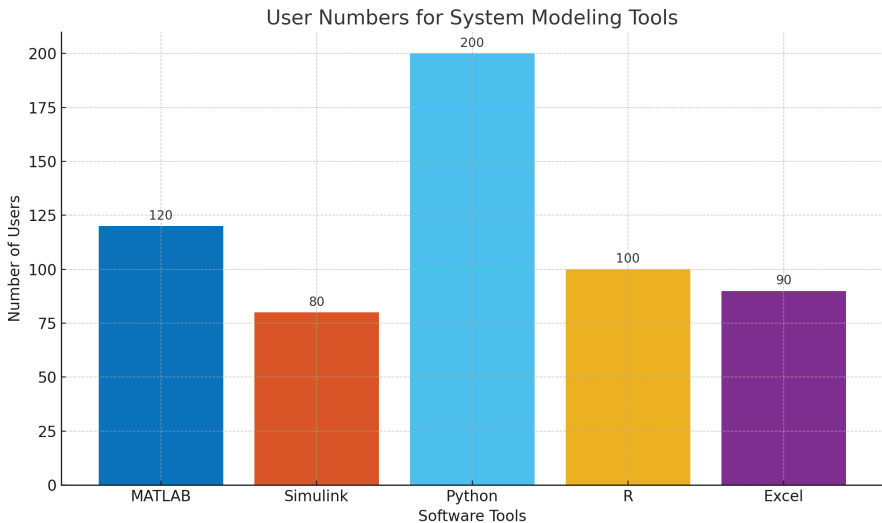
2. Bar Chart – Software Platform Popularity

Instructions: Create a bar chart comparing user numbers for five software tools commonly used in system modeling: **MATLAB, Simulink, Python, R, Excel**.

Write a short interpretation of the bar chart (3–4 sentences). Focus on comparisons using phrases like *the most popular, less widely used, approximately equal, twice as many, etc.*

Example start: The bar chart compares user popularity of five system modeling tools...

Use the example below



3. Pie Chart – Weekly Activities of a System Analyst

Instructions: Sketch a pie chart showing how a system analyst allocates working hours (e.g. coding – 40 %, meetings – 25 %, data analysis – 20 %, documentation – 10 %, training – 5 %). Describe the proportions and explain what this chart reveals about the nature of the analyst’s role.

You may use the example as a guide:

Pie Chart: System Analyst’s Weekly Time Allocation

- Coding – 40% 
- Meetings – 25% 
- Data Analysis – 20% 
- Documentation – 10% 
- Training – 5% 

Example start: This pie chart shows the distribution of weekly work tasks for a system analyst...

4. Flowchart – Data Processing Pipeline

Instructions: Create a simple flowchart showing stages of a basic data analysis pipeline: **Data Collection** → **Data Cleaning** → **Feature Selection** → **Model Training** → **Evaluation**. Write a 3–4 sentence explanation of each stage and its function in the process.

Example start: The flowchart outlines the key stages of a standard data processing pipeline in system analysis...

Optional Tools for Chart Creation (for self-study):

- **Excel / Google Sheets** – for bar and pie charts
- **Canva / PowerPoint** – for flowcharts and infographics
- **LaTeX (TikZ / pgfplots)** – for advanced users in academic publishing

UNIT 7

USING VISUAL AIDS: GENERAL PRINCIPLES. TALKING ABOUT THE CONTENT OF VISUAL AIDS

Visual aids such as graphs, charts, diagrams, and tables play a crucial role in academic and scientific communication. For students of System Analysis, mastering the use of visual materials is essential for presenting research findings, supporting arguments, and enhancing clarity in presentations and publications.

General Principles for Using Visual Aids

1. Clarity and Simplicity

Keep your visuals clear and uncluttered. Focus on the most relevant data and avoid overloading with information. Use labels and legends where necessary.

2. Consistency

Use consistent colors, fonts, and formatting styles throughout your visual materials. This helps create a professional and readable appearance.

3. Relevance

Make sure each visual directly supports your message or research goal. Avoid using visuals just for decoration.

4. Legibility

Ensure that text, numbers, and labels are large enough to read, especially during presentations.

Proper Referencing

Every visual aid in a written report should be accompanied by a title and a brief explanation or interpretation.

When presenting or writing about visuals, use appropriate structures and vocabulary to describe content accurately and effectively.

Useful Phrases:

- **Introducing a visual aid:**
 - *The chart illustrates...*
 - *As shown in the diagram...*
 - *Figure 2 presents the results of...*
- **Describing trends or data:**
 - *... was a steady increase in...*
 - *The percentage of errors dropped significantly between April and June.*
 - *This pie chart shows the distribution of...*
- **Interpreting information:**
 - *This suggests that...*
 - *We can infer from the graph that...*
 - *The data indicates a correlation between...*
- **Comparing data:**
 - *X is significantly higher than Y.*
 - *Unlike A, B shows a declining trend.*

Practice Task 1: Choose a visual aid (e.g., a chart showing network load, a table with algorithm performance metrics) and write a short paragraph (3–5 sentences) describing it using at least three of the expressions above.

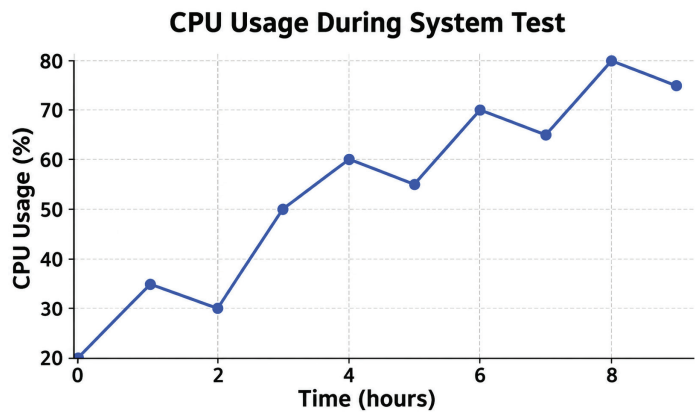
Practice Task 2: Match each academic phrase with its function (e.g., introducing, describing, interpreting, comparing):

1. *The graph demonstrates the number of users over time.*
2. *This indicates a drop in server efficiency.*
3. *Compared to 2020, the value has doubled.*
4. *As shown in Figure 3, the usage peaked in July.*

Practice Task 3: Complete the following sentences with appropriate academic phrases:

1. _____ shows the average processing time per task.
2. _____ a clear upward trend from March to May.
3. The data _____ a strong correlation between uptime and user satisfaction.

Practice Task 4: Look at a line graph showing CPU usage during system tests (you may find a sample online or draw one). Write 4–5 sentences describing what the graph shows. Use at least one phrase from each category (introducing, describing, interpreting, comparing).



Practice Task 5: Prepare a simple visual aid based on a dataset (e.g., task performance, system load, etc.). Include a title, axis labels, and a legend. Present it in written form using academic language.

UNIT 8

ANALYSIS OF RESULTS. OPINIONS AND DATA.

This section focuses on analyzing the outcomes of English language learning for Master's students in System Analysis, based on collected data and students' and instructors' opinions. It aims to provide useful vocabulary, phrases, and practical advice to help students reflect on their progress and effectively discuss their results.

Vocabulary

Ukrainian	English
Результати аналізу	Analysis of results
Дані	Data
Думки, думки експертів	Opinions, expert views
Підвищення рівня знань	Improvement in skills
Професійна комунікація	Professional communication
Оцінювання	Assessment
Зворотній зв'язок	Feedback
Виклики	Challenges
Практичні рекомендації	Practical recommendations

Useful Phrases

- The analysis of the data shows significant improvement in technical vocabulary.
- Students reported increased confidence in discussing system analysis topics in English.
- Feedback from instructors highlights the effectiveness of

- practical assignments.
- Some challenges include varying levels of initial proficiency and retention of new terms.
 - The data suggests that interactive learning methods enhance language skills.
 - Continuous practice and personalized support are essential for progress.

Opinions and Data Summary

- According to the survey, 85 % of students noticed better understanding of technical English after the course.
- Instructors emphasized that combining theory with practical tasks helps reinforce language skills.
- Students appreciated materials related to real-world system analysis, such as case studies and technical articles.
- The main difficulties identified were related to vocabulary retention and active speaking skills.
- Recommendations include regular revision sessions and the use of digital tools for vocabulary practice.

Practical Tips for Self-Assessment and Improvement

- Keep a learning journal to track your progress and challenges.
- Regularly review technical terms and try to use them in your own sentences.
- Practice speaking about your projects or recent topics in system analysis.
- Seek feedback from peers and instructors to identify areas for improvement.
- Use online resources like quizzes and flashcards to reinforce vocabulary.
- Participate actively in discussions and presentations to build confidence.

Practice Task 1: Match the English terms with their Ukrainian equivalents.

English	Ukrainian
a) Assessment	1) Підвищення рівня знань
b) Feedback	2) Оцінювання
c) Improvement in skills	3) Зворотній зв'язок
d) Challenges	4) Виклики

Practice Task 2: Complete the sentences with suitable words from the vocabulary list:

1. The _____ of the course showed a significant increase in technical vocabulary.
2. Students found some _____ in remembering new terms.
3. Regular _____ helps to identify areas for further improvement.
4. Positive _____ from instructors motivated students to keep practicing.

Practice Task 3: Write a short paragraph (5–7 sentences) describing your learning progress in English for system analysis. Use at least three key vocabulary words from this section.

Practice Task 4: Work in pairs. Take turns discussing:

- What improvements have you noticed in your English skills?
- What difficulties do you still face?
- Which learning methods do you find most effective?

Practice Task 5: Write a brief report in English summarizing your achievements and difficulties in learning English for system analysis. Include the following points:

- What skills have you improved the most?
- What challenges have you faced?

- What methods helped you learn better?
- What are your plans for further improvement?

Example:

During the course, I improved my understanding of technical vocabulary related to system analysis. I gained confidence in presenting my ideas in English and participating in discussions. However, I found it challenging to remember all new terms and to speak fluently. Using flashcards and practicing with classmates helped me a lot. In the future, I plan to watch more technical videos and practice speaking regularly.

UNIT 9

PRESENTATION TECHNIQUE AND PREPARATION. PRESENTING AN ARGUMENT. PRESENTATION STRUCTURE

This section provides Master's students in System Analysis with essential techniques and guidelines for preparing and delivering effective presentations in English. It focuses on structuring your presentation clearly and presenting arguments persuasively.

Vocabulary

Ukrainian	English
Презентація	Presentation
Підготовка	Preparation
Техніка презентації	Presentation technique
Аргумент	Argument
Структура презентації	Presentation structure
Вступ	Introduction
Основна частина	Main part / Body
Висновок	Conclusion
Аудиторія	Audience
Візуальні матеріали	Visual aids
Жести	Gestures
Інтонація	Intonation
Контакт з аудиторією	Eye contact
Чіткість	Clarity
Час презентації	Presentation time

Useful Phrases

- I prepare my presentation by researching the topic thoroughly.
- I organize my ideas into a clear structure before creating slides.
- It is important to practice your speech several times before the presentation.
- Visual aids help to support and clarify key points.
- I plan how to engage the audience and maintain their attention.
- Time management is essential to cover all points within the allotted time.

Presenting an Argument

Presenting an argument clearly and logically is key in academic presentations.

- Start with a clear **thesis statement** or main idea.
- Support your argument with **facts, data, and examples** relevant to system analysis.
- Use linking words such as “**firstly**,” “**however**,” “**therefore**,” and “**in conclusion**” to guide your audience.
- Anticipate and address possible **counterarguments**.
- Summarize your points clearly to reinforce your argument.

Example:

Firstly, the use of system modeling improves decision-making by providing a clear overview of complex processes. However, it requires accurate data input, which can be a challenge. Therefore, investing in data quality control is essential for successful system analysis.

Presentation Structure

A clear structure helps your audience follow your ideas easily. Use the following standard format:

1. Introduction

- Greet the audience and introduce yourself.
- State the topic and purpose of your presentation.

- Give an overview of the main points.
2. **Main Part (Body)**
 - Present 3–4 key points or arguments.
 - Support each point with examples, data, or visuals.
 - Use clear transitions between points.
 3. **Conclusion**
 - Summarize the main ideas.
 - Restate the importance of your topic.
 - End with a strong closing statement or call to action.

Practical Tips for Effective Presentations

- Speak clearly and at a moderate pace.
- Use appropriate gestures and maintain eye contact.
- Avoid reading directly from notes or slides.
- Use visual aids such as charts, graphs, or diagrams to illustrate points.
- Prepare for possible questions from the audience.
- Manage your presentation time carefully.

Dialogue Example:

Questions and Answers After a Presentation

Context: A Master’s student has just finished a presentation on “*The role of system modeling in solving complex problems.*” The instructor and classmates ask questions to clarify and discuss the topic.

Instructor: Thank you for your presentation. Could you explain why system modeling is particularly important in complex problem-solving?

Student: Certainly. System modeling helps visualize all components and their interactions, which makes it easier to identify potential issues and optimize the processes before implementation.

Classmate 1: What challenges did you mention about collecting accurate data for system models?

Student: Yes, one major challenge is ensuring data quality and completeness. Inaccurate or missing data can lead to incorrect

models, which may result in poor decision-making.

Classmate 2: Can you give an example of a tool or software commonly used for system modeling?

Student: Sure. Tools like MATLAB, Simulink, and Enterprise Architect are popular because they offer comprehensive features for creating detailed models and simulations.

Instructor: How do you think machine learning can complement system modeling in system analysis?

Student: Machine learning can analyze large datasets to detect patterns and predict system behavior, which can then be integrated into system models for more accurate and dynamic analysis.

Classmate 3: How would you explain the benefits of system modeling to someone outside the IT field?

Student: I would say it's like creating a detailed blueprint before building a house – it helps plan everything carefully to avoid costly mistakes later.

Instructor: Excellent answers. Do you have any questions for us or your peers?

Student: Thank you. I'm curious about your experience – which challenges in system modeling have you encountered in your projects?

Practice Task 1: Prepare a 5-minute presentation in English on one of the following topics related to System Analysis:

- The importance of data quality in system analysis.
- How system modeling supports complex decision-making.
- Challenges in implementing distributed systems.
- The role of machine learning in optimizing systems.

Guidelines:

- Use the presentation structure provided.
- Include at least one argument supported by data or example.
- Practice speaking clearly and confidently.
- Prepare 1–2 visual aids (optional).
- Be ready to answer questions after your presentation.

UNIT 10

WRITING AND SPEAKING FOR SPECIFIC AUDIENCES. GIVING ORAL PRESENTATIONS. DIPLOMA PAPER PRESENTATION

This section guides Master's students in System Analysis on how to effectively write and speak for specific academic and professional audiences. It focuses on techniques for delivering oral presentations and presenting diploma papers in English.

Writing and Speaking for Specific Audiences

Understanding your audience is crucial when preparing written or oral communication. The language, tone, and style should match the expectations of your listeners or readers.

- **Academic audience:** Use formal language, technical terminology, clear structure, and evidence-based arguments.
- **Professional audience:** Emphasize practical applications, results, and recommendations. Use concise and clear language.
- **Mixed audience:** Balance technical detail with accessible explanations.

Vocabulary

Ukrainian	English
Аудиторія	Audience
Цільова аудиторія	Target audience
Академічний стиль	Academic style
Професійний стиль	Professional style

Технічна термінологія

Technical terminology

Тон висловлення

Tone of voice

Структура тексту

Text structure

Effective oral presentations require preparation and attention to delivery.

Useful phrases for starting a presentation:

- Good morning/afternoon. My name is [Name], and today I will talk about...
- The topic of my presentation is...
- I will start with an overview of...

Useful phrases for explaining and emphasizing points:

- First, I would like to highlight...
- It is important to note that...
- According to recent studies...
- Let me give you an example...

Useful phrases for concluding:

- To sum up,...
- In conclusion,...
- Thank you for your attention. I am ready to answer your questions.

Tips for oral presentations:

- Speak clearly and at a steady pace.
- Maintain eye contact with the audience.
- Use appropriate gestures to emphasize key points.
- Avoid reading from notes word-for-word.
- Use visual aids (slides, charts) to support your message.

Diploma Paper Presentation

Presenting your diploma paper is a critical part of your Master's degree completion. It should clearly communicate your research findings and their significance.

Structure of a diploma paper presentation:

1. Introduction

- Briefly introduce your research topic.
- State the research problem and objectives.
- Explain the relevance of your work.

2. Methodology

- Describe the methods and tools used.
- Justify why you chose them.

3. Results

- Present key findings with data or examples.
- Use charts or tables if needed.

4. Discussion

- Interpret the results.
- Compare with existing studies.
- Discuss limitations and implications.

5. Conclusion

- **Summarize main contributions.**
- Suggest directions for future research.

Practical advice:

- Prepare slides with clear headings and bullet points.
- Practice your presentation multiple times to ensure timing.
- Anticipate possible questions and prepare answers.
- Use technical terms correctly, but explain them if the audience is mixed.

Useful Phrases for Answering Questions During Diploma Defense

Clarifying questions:

- Could you please repeat the question?
- If I understand correctly, you are asking about...
- That's an interesting question. Let me explain...

Answering questions about methodology:

- We chose this method because it allows for accurate analysis of...
- The main advantage of this approach is...
- One limitation is..., but we mitigated it by...

Answering questions about results:

- Our results show that...
- According to the data, we can conclude...
- This finding confirms the hypothesis that...

Answering questions about implications and future work:

- These results can be applied to improve...
- For future research, it would be useful to explore...
- This study lays the groundwork for further investigations into...

If you don't know the answer:

- That is a good question. I will need to look into it further.
- I haven't encountered that aspect, but I appreciate your input.
- I'm not sure about that, but I can discuss it after the presentation.

Sample Text for Diploma Paper Presentation Introduction (English)

Good morning, ladies and gentlemen.

My name is [Your Name], and today I am going to present my *diploma paper titled "[Your Topic]"*. *The focus of my research is on [briefly describe the main theme, e.g., improving system modeling techniques for complex systems].*

The purpose of this study is to analyze [state the research problem] and to develop effective solutions for [state objectives or goals]. This topic is important because [explain the relevance and potential impact, e.g., it helps optimize decision-making processes in large-scale information systems].

In my presentation, I will first describe the methodology used, then present the key results, followed by a discussion of their

implications. Finally, I will conclude with recommendations and possible directions for future research.

Thank you for your attention.

Practice Task: Prepare a 7–10 minute presentation of your diploma paper following the structure above. Focus on clear communication and engaging your audience.

UNIT 11

TYPES OF RESEARCH PAPERS. INTERNATIONAL SCIENTIFIC INDEXING

This section introduces Master's students in System Analysis to the main types of research papers and provides an overview of international scientific indexing systems. Understanding these concepts is essential for academic writing and publishing.

Types of Research Papers

There are several common types of research papers used in academic and scientific work:

Ukrainian	English	Description
Оглядова стаття	Review paper	Summarizes and analyzes existing research on a topic.
Оригінальна дослідницька стаття	Original research paper	Presents new data or findings based on experiments or studies.
Методологічна стаття	Methodological paper	Describes new methods or techniques used in research.
Аналітична стаття	Analytical paper	Focuses on detailed analysis and interpretation of data.

Коротке повідомлення	Short communication	Brief report on preliminary results or novel observations.
Теоретична стаття	Theoretical paper	Discusses theoretical models or frameworks.
Кейс-стаді	Case study	Detailed examination of a specific instance or example.

Useful phrases for describing research papers:

- This paper presents original research on...
- The review article summarizes recent developments in...
- Our study proposes a new methodological approach to...
- The case study illustrates the application of system analysis in...

International Scientific Indexing

Scientific indexing is the process of listing research papers and journals in international databases to increase visibility and credibility.

Key indexing systems include:

Назва системи	Опис
Scopus	One of the largest abstract and citation databases of peer-reviewed literature.
Web of Science	A multidisciplinary citation database providing comprehensive research coverage.
IEEE Xplore	Digital library for engineering and technology publications.
Google Scholar	Freely accessible search engine for scholarly literature across disciplines.
DOAJ (Directory of Open Access Journals)	Indexes open-access journals from various fields.

Why is indexing important?

- Indexed journals have higher academic recognition.
- Papers indexed in these databases are more likely to be cited.
- Indexing ensures that research reaches an international audience.
- It supports academic career development and collaborations.

Useful phrases for discussing indexing:

- Our article was published in a journal indexed by Scopus.
- The paper is listed in Web of Science, which indicates high quality.
- Publishing in indexed journals increases the visibility of our research.
- IEEE Xplore is a key resource for technology-related publications.

If you are preparing a research paper, always check whether the target journal is indexed in these databases to ensure your work gains the appropriate academic exposure.

Practice Task 1: Match the Ukrainian terms with their English equivalents:

- | | |
|-------------------------|-------------------------|
| 1. Оглядова стаття | a) Theoretical paper |
| 2. Кейс-стаді | b) Short communication |
| 3. Методологічна стаття | c) Methodological paper |
| 4. Коротке повідомлення | d) Review paper |
| 5. Теоретична стаття | e) Case study |

Practice Task 2: Read the short description and identify the type of research paper:

This paper provides a comprehensive summary of recent advances in machine learning algorithms used in system optimization.

What type of paper is this? _____

Practice Task 3: Write a short paragraph (4–5 sentences) describing your diploma research paper using the correct type of research paper and mention if it is suitable for publication in a journal indexed by Scopus or IEEE Xplore. Use these starter phrases:

- My diploma paper is an example of a/an _____.
- It focuses on _____.
- This research is important because _____.
- I plan to submit it to a journal indexed in _____.

Practice Task 4: Prepare answers for these questions:

- What are the differences between a review paper and an original research paper?
- Why is it important to publish in indexed journals?
- Which international indexing systems do you know? Which one is most relevant to system analysis?

Practice Task 5: In pairs or groups, discuss the following:

- How does publishing in indexed journals affect your academic and professional career?
- What challenges do young researchers face when trying to publish in international indexed journals?
- Share your experience (or expectations) about writing and submitting research papers.

UNIT 12

METHODS OF SCIENTIFIC RESEARCH. STRUCTURING YOUR SCIENTIFIC PAPER

This section introduces Master's students in System Analysis to common methods used in scientific research and provides guidance on structuring scientific papers effectively.

Methods of Scientific Research

Scientific research involves systematic investigation to establish facts, develop new knowledge, or solve problems. Depending on the research goals, various methods can be applied:

- **Experimental Method**

Conducting controlled experiments to test hypotheses and observe outcomes.

- **Analytical Method**

Breaking down complex problems into smaller components for detailed examination.

- **Simulation and Modeling**

Using mathematical or computer models to simulate real-world systems and predict behavior.

- **Statistical Analysis**

Applying statistical tools to analyze data sets and infer conclusions.

- **Case Study**

In-depth analysis of a particular system or event to understand broader principles.

- **Comparative Analysis**

Comparing different systems, methods, or results to evaluate effectiveness or identify trends.

Vocabulary

Ukrainian	English
Метод дослідження	Research method
Експериментальний метод	Experimental method
Аналітичний метод	Analytical method
Моделювання	Modeling
Статистичний аналіз	Statistical analysis
Кейс-стаді	Case study
Порівняльний аналіз	Comparative analysis
Гіпотеза	Hypothesis

Useful phrases for describing research methods:

- This study uses the experimental method to investigate...
- We applied simulation techniques to model the system's behavior.
- Statistical analysis was performed to evaluate the data collected.
- A case study approach was chosen to explore the problem in detail.

Structuring Your Scientific Paper

A clear and logical structure is essential for effective communication of research findings. Most scientific papers follow a standard format:

1. Title

Clear and concise, reflecting the main topic of the research.

2. Abstract

A brief summary of the purpose, methods, results, and conclusions (usually 150–250 words).

3. Introduction

- Background information and context
- Statement of the research problem
- Objectives and hypotheses

4. Methods

- Description of research design and methodology
- Data collection and analysis techniques

5. Results

- Presentation of findings using text, tables, and figures
- Objective reporting without interpretation

6. Discussion

- Interpretation of results
- Comparison with previous studies
- Limitations and implications

7. Conclusion

- Summary of main findings
- Recommendations and future research directions

8. References

List of all sources cited in the paper, formatted according to a specific style guide (e.g., APA, IEEE).

Useful phrases for structuring a paper:

- The introduction provides background information on...
- In the methods section, we describe the procedures used to...
- The results indicate that...
- The discussion interprets the findings and compares them with...
- The conclusion summarizes the main outcomes of the study.

Practice Task 1: Write the Ukrainian equivalents of the following terms.

English	Ukrainian
Experimental method	
Analytical method	
Modeling	
Statistical analysis	
Case study	
Hypothesis	

Practice Task 2: You are given the title of a research paper: “**Optimization of Data Processing Algorithms in Distributed Systems**”. Write 1–2 sentences describing what you would include in each section of the paper:

- Introduction
- Methods
- Results
- Discussion
- Conclusion

Practice Task 3: Write a short abstract (150–200 words) for a research paper on a system analysis topic of your choice. Include the purpose, methods, key results, and conclusion.

Practice Task 4: Prepare answers to these questions:

- What research methods are most suitable for system analysis? Why?
- How do you structure a scientific paper?
- Why is it important to clearly separate the Methods and Results sections?

Practice Task 5: Discuss with a partner:

- Share your experience or expectations about writing scientific papers.
- What difficulties do you face when structuring your research paper?
- How do research methods influence the presentation of your results?

UNIT 13

TERMINOLOGY GLOSSARY.

WORKING WITH ACADEMIC VOCABULARY

Understanding and using academic and technical vocabulary correctly is essential for Master's students in System Analysis. This section introduces core terms commonly used in academic texts and research papers and provides strategies for expanding and applying your professional vocabulary.

Vocabulary		
Ukrainian	English	Definition (EN)
Системний підхід	System approach	A structured way of solving complex problems by analyzing the system as a whole.
Вимоги до системи	System requirements	The functional and non-functional features that a system must fulfill.
Архітектура системи	System architecture	The overall design and structure of a system.
Алгоритм	Algorithm	A step-by-step procedure for solving a problem or performing a task.
Збір даних	Data collection	The process of gathering information for analysis.

Обробка даних	Data processing	Converting raw data into meaningful information.
Оптимізація	Optimization	Improving a system or process to make it more effective or efficient.
Модель	Model	A simplified representation of a system used for analysis or simulation.
Аналіз вимог	Requirements analysis	The process of determining user expectations for a new or modified product.
Валідація	Validation	Ensuring that the final system meets the intended requirements.

Strategies for Learning Academic Vocabulary

- **Use a personal glossary**

Keep a vocabulary notebook or digital file where you collect and regularly review academic terms.

- **Learn words in context**

Focus not only on definitions but also on example sentences from research articles or textbooks.

- **Group vocabulary by topic**

Organize terms by themes (e.g., data analysis, system modeling, project management).

- **Use collocations and phrases**

Pay attention to how academic words are commonly combined:

- “develop a model”
- “analyze requirements”
- “optimize performance”
- “conduct validation”

Useful Academic Phrases in System Analysis

- The goal of this paper is to evaluate the effectiveness of...
- The proposed algorithm significantly improves system performance.
- Our findings are based on detailed data analysis and simulation.
- This study presents a model designed to...
- The system was validated using real-world case studies.
- Further research is needed to enhance scalability and reliability.

Practice Task 1: Match the term with the correct definition:

- | | |
|------------------------|---|
| 1. System requirements | a) Ensuring the system meets the specified goals |
| 2. Optimization | b) A procedure or set of rules to solve a problem |
| 3. Validation | c) A set of conditions the system must satisfy |
| 4. Algorithm | d) Structural design of a system |
| 5. System architecture | e) Improving performance or efficiency |

Practice Task 2: Fill in the blanks

Complete the sentences using the appropriate academic term:

1. Our team used a machine learning _____ to detect system anomalies.
2. During the initial stage, we conducted thorough _____ of user needs.
3. The final stage of the project involved _____ the model with real data.
4. One of the main goals was the _____ of resource usage in distributed systems.

Practice Task 3: Write a short paragraph (4–5 sentences) describing a system analysis project, using at least **four terms** from the glossary above.

Practice Task 4: Translate the following sentences into Ukrainian, paying attention to the accurate use of scientific and technical terminology:

1. The architecture of the proposed system ensures scalability and fault tolerance.
2. We collected performance data using a real-time monitoring tool.
3. The optimization of the algorithm reduced processing time by 30 %.
4. This paper presents a model for predicting system load under varying conditions.
5. Validation confirmed that all functional requirements were met.

Practice Task 5: Explain the following technical terms to another student in English. Use simple definitions and examples:

- System requirements
- Model
- Optimization
- Data processing
- Validation

You can start like this: *A model is a simplified version of a real system. For example, in our coursework, we created a model to simulate traffic flow.*

Practice Task 6: Rephrase the following sentences using synonyms or alternative wording while keeping the original meaning:

1. The algorithm was implemented to improve system efficiency.
2. We analyzed the data to identify performance bottlenecks.
3. The proposed approach was validated with experimental results.

Practice Task 7: Complete the table by forming the correct noun and adjective for each verb:

Verb	Noun	Adjective
to analyze		
to validate		
to optimize		
to model		

UNIT 14

ACADEMIC ESSAYS

Academic writing is an essential skill for Master's students in System Analysis, especially when presenting research results, analyzing problems, or proposing technical solutions. One of the key forms of academic writing is the essay. This section introduces the structure of academic essays, useful vocabulary, and practical tips for effective writing.

What Is an Academic Essay?

An academic essay is a structured piece of writing that presents a clear argument or discussion based on evidence. In the context of System Analysis, it may focus on:

- Evaluating different analytical methods
- Discussing challenges in system modeling
- Comparing optimization approaches
- Reflecting on the impact of new technologies

A standard essay includes the following parts:

Section	Purpose
Introduction	Introduces the topic, provides background, and states the thesis (main argument).
Body paragraphs	Each paragraph presents one main idea with evidence, examples, or explanations.
Conclusion	Summarizes the key points and restates the thesis, often with a final thought or recommendation.

Useful Vocabulary and Phrases

Function	Phrases
Introducing the topic	<i>This essay explores... / The aim of this paper is to...</i>
Giving examples	<i>For example... / A case in point is...</i>
Comparing ideas	<i>Similarly... / In contrast... / On the other hand...</i>
Presenting evidence	<i>According to recent research... / The data suggest...</i>
Concluding	<i>To sum up... / In conclusion... / This essay has demonstrated that...</i>

Essay Topics in System Analysis (Examples)

- The role of system modeling in modern data analysis
- Pros and cons of centralized vs. distributed systems
- How machine learning transforms system optimization
- Challenges of requirement analysis in complex systems

Practice Task 1: Choose one of the topics above. Create a short outline using this structure:

- **Introduction:**
Topic + thesis statement
- **Body Paragraph 1:**
Main idea + supporting evidence
- **Body Paragraph 2:**
Main idea + example
- **Conclusion:**
Summary + restated thesis

Practice Task 2: Write a clear thesis statement for the following topic: **“The importance of optimization in system performance.”**

Practice Task 3: Work in pairs. Discuss:

- What is the biggest challenge when writing essays in English?
- How do you structure your ideas logically?
- How can essays be useful for your professional development?

Sample Academic Essay

Title: *The Role of System Modeling in Solving Complex Problems*

Introduction

In the era of digital transformation, complex systems are increasingly common in fields such as engineering, business, and information technology. System modeling plays a crucial role in understanding, designing, and optimizing these systems. This essay argues that system modeling is essential for analyzing interdependencies, predicting behavior, and improving decision-making in complex environments.

Body Paragraph 1: Understanding Complexity through Modeling

System modeling allows analysts to break down complex systems into manageable components. By using diagrams and formal representations, such as UML or data flow models, it becomes possible to visualize the structure and behavior of the system. This is particularly useful in identifying relationships and dependencies between subsystems, which are often invisible without a model.

Body Paragraph 2: Enhancing Predictability and Simulation

One of the most powerful advantages of system modeling is the ability to simulate outcomes under different scenarios. For example, in distributed systems, models can be used to test performance under varying loads. This predictive capability helps avoid costly failures and supports informed design choices before actual implementation.

Body Paragraph 3: Supporting Decision-Making and Communication

Models serve as a communication tool between stakeholders, including engineers, managers, and clients. A well-structured model clarifies system logic and supports collaborative decision-making.

It also contributes to documentation and future maintenance by providing a clear reference of the system's architecture.

Conclusion

To sum up, system modeling is an indispensable part of system analysis. It helps deconstruct complexity, anticipate system behavior, and facilitate effective communication. As systems continue to grow in scale and sophistication, the ability to model them accurately will remain a key skill for analysts and developers alike.

Vocabulary from the Essay

Word/Phrase	Meaning
Digital transformation	The integration of digital technology in all areas
Subsystem	A smaller component of a larger system
UML	Unified Modeling Language – a standard modeling tool
Predictive capability	Ability to foresee outcomes based on data
Stakeholder	A person with interest in a system/project
Deconstruct complexity	To analyze and simplify complex structures

UNIT 15

SUBMITTING RESEARCH PAPERS

For Master's students in System Analysis, submitting research papers to conferences or academic journals is an essential step in becoming part of the international scientific community. This section explains the key stages of the submission process, presents useful academic vocabulary, and offers practical guidance on preparing and submitting a high-quality paper in English.

The Submission Process: Key Stages

Stage	Description
1. Choosing a journal or conference	Select a reputable platform indexed in Scopus, Web of Science, or IEEE Xplore.
2. Reading submission guidelines	Carefully study formatting rules, word count, citation style, and deadlines.
3. Preparing the manuscript	Write and revise your paper according to the required structure (abstract, keywords, sections).
4. Formatting and proofreading	Use academic English, check grammar and terminology, and format the text according to the publisher's template.
5. Submitting online	Upload your paper using the journal's submission system and include a cover letter if required.
6. Responding to reviewers	Be ready to revise the paper based on peer review comments.

Vocabulary

English Term	Ukrainian Equivalent
Submission deadline	Кінцевий термін подання
Peer review	Рецензування
Manuscript	Рукопис
Cover letter	Супровідний лист
Revisions	Виправлення, доопрацювання
Guidelines for authors	Вимоги до авторів
Plagiarism check	Перевірка на плагіат
Acceptance / rejection	Прийняття / відхилення

Useful Phrases

- *We are pleased to submit our manuscript entitled “...” for consideration in your journal.*
- *This paper presents the results of a research project conducted at the Department of System Analysis.*
- *The manuscript has not been published or submitted elsewhere.*
- *We believe that our findings will be of interest to readers working in the field of data-driven optimization.*
- *We are grateful for the opportunity to revise our paper and respond to reviewers’ comments.*
- *Please find attached the revised version of the manuscript along with a response letter.*

Practical Tips for Submission

✓ Before Submitting

- Choose a journal/conference that matches your research topic.
- Follow formatting and referencing guidelines precisely (APA, IEEE, etc.).

- Check grammar, spelling, and terminology — use Grammarly or ask a peer to review.

✓ **During Submission**

- Use clear file names (e.g., Lastname_PaperTitle_2025.pdf).
- Include all necessary documents (e.g., cover letter, copyright form).
- Double-check that your contact information is correct.

✓ **After Submission**

- Monitor your email for editor or reviewer feedback.
- Be polite and professional in your responses.
- Be patient – peer review may take several weeks or months.

Practice Task 1: Match the academic term to its correct definition.

Term	Definition
1. Peer review	A. A formal document sent with a paper submission
2. Submission deadline	B. The process of evaluating a manuscript by other experts
3. Cover letter	C. The final day to submit your research paper
4. Revisions	D. Changes made based on reviewer feedback
5. Manuscript	E. The draft version of a scientific paper

Practice Task 2: Complete the sentences with appropriate words from the box:

(plagiarism / submitted / reviewers / formatting / feedback)

1. Before submitting your paper, always check for _____ to avoid ethical issues.
2. I have already _____ my manuscript to the Systems Modeling Conference.
3. The journal's _____ guidelines are based on the IEEE citation style.

4. After the peer review, we received detailed _____ from two experts.
5. The _____ asked us to clarify the research methods and update the references.

Practice Task 3: Imagine you received reviewer comments suggesting that you clarify your methodology section and correct several grammatical errors. Write a short, polite response in English (3–4 sentences).

Example Response:

Dear Reviewer,

Thank you for your valuable comments. We have revised the methodology section for greater clarity and corrected the identified grammatical issues. We appreciate your helpful suggestions and believe the paper has improved as a result.

Practice Task 4: Complete the dialogue between two students preparing to submit a paper.

Anna: Are you ready to submit your paper to the IEEE Systems Journal?

Mark: Almost. I'm still working on the _____.

Anna: Make sure to follow the journal's _____ carefully.

Mark: I will. Did you include a _____ with your submission?

Anna: Yes, and I also ran a final _____ check using Grammarly.

Practice Task 5: Correct the mistakes in this email

Subject: I send paper

Hello Committee,

I write to submit paper to journal. The paper is about modeling systems in companys. Please see attached my work. Thank you and hope for answer.

Best,

Ivan

Practice Task 6: Writing a Cover Email. Write a short formal email to submit your research paper to an international conference on System Analysis.

Example:

Subject: Submission of Paper to the International Conference on System Analysis 2025

Dear Conference Committee,

I am pleased to submit our paper titled “*Modeling Distributed Systems for Real-Time Optimization*” for consideration at the International Conference on System Analysis, to be held in Warsaw in October 2025.

The paper presents original research conducted by our team at [University Name] and has not been submitted elsewhere.

Please find the manuscript attached. We look forward to your feedback.

Best regards,

Dr. Olena Kravchenko

Department of Psychology, Taras Shevchenko National University of Kyiv

olena.kravchenko@univ.kiev.ua

Practice Task 7: Work in pairs. One of you will play the role of a student, and the other will be an academic advisor. Your goal is to practice a realistic conversation about submitting a research paper to an international journal. Use academic vocabulary, ask relevant questions, and respond appropriately.

Below is an example to guide your role play:

Student: Hello, Professor. I’ve finished my research paper and would like to submit it to an international journal.

Advisor: Great! Have you chosen a journal and checked the submission guidelines?

Student: Yes, I’m planning to send it to *Computational Systems Journal*. They require APA formatting.

Advisor: Excellent. Don’t forget to include a cover letter and check the English thoroughly before submission.

GLOSSARY OF ACADEMIC ENGLISH TERMS (UNITS 1–15)

A

- **Abstract** – A short summary of a research paper or presentation.
- **Academic courses** – Structured sets of learning experiences in a particular field of study.
- **Academic vocabulary** – Words and phrases frequently used in academic writing and speaking.
- **Application form** – A document to be filled out when applying for a program, job, or course.
- **Argument** – A reason or set of reasons presented to persuade others that an idea or opinion is right or wrong.
- **Audience** – The group of people a speaker or writer is addressing.

B

- **Bibliography** – A list of the books, articles, and other sources used or consulted in preparing a work.
- **Body (of an essay/paper)** – The central part where main points and supporting arguments are developed.

C

- **Citation** – A reference to a source used in a research paper.
- **Conference** – A formal meeting for discussion, often involving presentations of research.
- **Course syllabus** – An outline of the subjects in a course of study.
- **Critical thinking** – The process of analyzing and evaluating information objectively.

D

- **Data** – Factual information used as a basis for reasoning or analysis.

- **Data analysis** – The process of examining and interpreting data to draw conclusions.
- **Diagram** – A simplified drawing showing the appearance, structure, or workings of something.
- **Diploma paper** – A final research paper required for the completion of a degree.

E

- **Evidence** – Information indicating whether a belief or proposition is true or valid.
- **Evaluation** – The process of judging the value or significance of something.
- **Essay** – A short piece of writing on a particular subject.

F

- **Feature selection** – The process of identifying which variables are most useful in a dataset for model building.
- **Feedback** – Information provided about performance or understanding, used for improvement.

G

- **Graph** – A diagram showing the relationship between variables, often used to visualize data.
- **Glossary** – A list of terms with definitions.

H

- **Hypothesis** – A proposed explanation made on the basis of limited evidence as a starting point for further investigation.

I

- **Impact** – The strong effect or influence something has.
- **Indexing (scientific)** – The listing of research in databases for academic visibility.
- **Interpretation** – The act of explaining the meaning of data or results.

J

- **Journal** – A periodical publication containing scholarly articles and research.

K

- **Key findings** – The most important discoveries in a research study.

L

- **Literature review** – A survey of scholarly sources on a specific topic.
- **Learning habits** – Regular practices or routines that aid in the acquisition of knowledge.

M

- **Methodology** – A system of methods used in a particular area of study or activity.
- **Model training** – The process of teaching an algorithm to recognize patterns using data.

N

- **Note-taking** – The practice of recording key points of information.
- **Numbers and statistics** – Quantitative data used to support arguments and findings.

O

- **Online learning** – Education that takes place over the internet.
- **Oral presentation** – The act of presenting information to an audience verbally.

P

- **Paraphrasing** – Restating information using different words.
- **Peer review** – The evaluation of work by one or more people with similar competencies.
- **Plagiarism** – Using someone else's work or ideas without proper acknowledgment.
- **Presentation** – A speech or visual display of information to an audience.
- **Proofreading** – The process of checking for errors in a text.

Q

- **Qualitative research** – Research that explores phenomena through observation and interpretation.

- **Quantitative research** – Research that focuses on numerical data and statistical analysis.

R

- **Reference** – A source of information cited in a text.
- **Research paper** – A detailed essay that presents the results of an investigation.

S

- **Scientific conference** – An event where researchers present and discuss their work.
- **Sources** – Texts or data used to support academic work.
- **Structure (of a presentation)** – The organized format in which a presentation is delivered.

T

- **Terminology** – The body of terms used with a particular technical application.
- **Thesis statement** – A sentence that summarizes the main point of an essay.

U

- **University application** – The process of applying to a higher education institution.
- **Usage (of visual aids)** – The effective application of diagrams, charts, or graphs in a presentation.

V

- **Visual aids** – Items like slides, charts, and videos used to support a spoken presentation.

W

- **Workshop** – An interactive session focused on developing specific skills or knowledge.
- **Writing for specific audiences** – Tailoring content to suit the needs and expectations of different readers or listeners.

Y

- **Year-end project** – A comprehensive assignment typically submitted at the end of an academic year.

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Навчальне видання

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