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Рецензенти:

д-р пед. наук, проф. *Б. І. Шуневич*

(Львівський державний університет безпеки життєдіяльності);

д-р пед. наук, проф. *Л. І. Морська*

(Тернопільський національний педагогічний університет імені Володимира Гнатюка);

канд. пед. наук, доц. *Н. В. Рубель*

(Львівський національний університет імені Івана Франка)

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The course book was compiled in accordance with all the requirements and standards for EFL, ESP, and EAP teaching in institutions of higher education. It aims at building students' knowledge about the conventions and strategies of academic discourse in sciences as well as developing their skills of active reading, academic writing and speaking, building up general academic and disciplinary specific vocabulary.

The course book can be used for teaching ESP and EAP courses to junior and senior undergraduate, graduate and post-graduate students majoring in sciences. It can also serve as a self-study guide for scientists striving to improve their English academic skills.

Микитенко Н. О.

М 59 Developing academic literacy: EAP for science majors = Формування академічної компетентності: курс англійської мови для студентів та аспірантів природничих спеціальностей : навч. посібник / Н. О. Микитенко, В. Т. Сулим, М. С. Козолуп. – Львів : ЛНУ імені Івана Франка, 2017. – 224 с.

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Навчальний посібник укладено відповідно до вимог щодо навчально-методичного забезпечення викладання дисциплін «іноземна мова» та «іноземна мова професійного спрямування» у вишій школі.

Посібник призначено для розвитку теоретичних і практичних знань студентів старших курсів, магістрантів, аспірантів та наукових працівників природничої галузі. Зосереджено увагу на особливостях англомовної науково-академічної комунікації, лінгвістичній природі та стратегії дискурсу природничих наук, формуванні навичок та умінь активного читання, академічного письма й усного мовлення у природничій сфері, розширення словникового запасу загальнонаукової та професійної лексики.

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CONTENTS

Introduction	7
Unit 1. Active Reading	9
Annotation	10
Reading Response Journal.....	12
Unit 2. Academic Writing	19
Summary	19
Summary Essay	21
Academic Essay Structure	25
Essay Writing Process.....	29
Reading Response Essay.....	36
Review.....	39
Unit 3. Academic Writing and Plagiarism	45
How to Avoid Plagiarism	45
Documentation Styles.....	52
Unit 4. Communication in the Sciences	53
Scientific Writing: Specific Features	53
Laboratory Notebook	59
Lab Report	
Research Paper	62
Scientific Conference.....	71
Research and Grant Proposals	77
The Fulbright Program in Ukraine.....	82
Appendix 1. Reading Bank	93
Values in Science: An Educational Perspective.....	93
To Count Our Days: The Scientific and Ethical Dimensions of Radical Life Extension	102
The Ethical Dimensions of Geoenineering: Solar Radiation Management through Sulphate Particle Injection.....	113
Biotechnology, Ethics, and the Politics of Cloning.....	127
Nanotechnology, Society, and Ethics (excerpt).....	151

Appendix 2. Scientific Writing Samples	162
Laboratory Notebook.....	162
Lab Report.....	
Research Paper	166
Grant Proposal	194
Appendix 3. Materials for Reviewing and Feedback	204
Writing evaluation questions.....	
Peer review checklist for an argument essay draft.....	204
Presentation peer review sheet.....	206
Appendix 4. CSE Documentation Systems	207
References	213
Academic Glossary	215

INTRODUCTION

Humans are social beings. They interact with each other through communication. Ability to communicate effectively is fundamental to a successful life in our society and it is of great importance for all areas of life. Communicative competence is needed not only in social interaction at the interpersonal level, but also at organizational and public levels, as well as for intercultural and professional exchanges. As we participate in such interactions within various social groups, we join different discourse communities, for example professional, scientific, cultural or academic.

Academic communication refers to various forms of spoken and written discourse taking place in the context of higher education. The written forms might be exemplified by conference proposals, research papers, lab reports, academic essays, etc. The spoken academic discourse can be represented by group discussion or project work, conference presentation or student-teacher classroom interaction.

As you progress with your university education, you socialize in the academic discourse community which means you develop your voice, identity and agency in it with the help of language. Learning scientific discourse additionally involves learning to think, act, speak and write like a scientist in a scientific community of practice.

The **“Basics of English Academic Communication for Science Majors”** course will facilitate your academic discourse socialization process by familiarizing you with essential language material (academic vocabulary, structures and patterns for several academic genres), providing you guidelines on organizing your writing process and preparing oral presentations, offering you some material for reading and discussion. This will help you develop basic academic communication skills which in their turn will provide a basis for your further academic and professional success.





ACTIVE READING

We live in a reading-oriented society. Much of secondary and high school as well as university instruction is reading-centered; and getting on in life after school largely depends on one's reading skills. The accumulated knowledge of humankind – from literature to logic and from physics to paleontology – is easily accessible to good readers, and virtually unavailable to poor readers. Most of what we know that is of enduring value is learned by reading from print – the thoughts, ideas and feelings of other minds. Reading can bring us a lot of pleasure. On the other hand, good reading skills are an essential prerequisite for our educational and career success. Most university students are assessed through the production of various written assignments. As your education and interests become more specialized, your writing will increasingly depend on your being informed by the knowledge of your specialized field. Your teachers and fellow students will expect you to base your statements and judgments on your ever-increasing body of knowledge, on material you have read, learned, evaluated, and built upon.

Reading and writing go hand in hand. The better you read, the better you write. In order to develop your own thoughts, you need to be able to gather information from reading; even more, you need to understand the ideas and implications of your reading so that you can respond. You have to read well enough to see what people are really discussing, what the real issues are. You need to understand what has already been written to decide intelligently what you can contribute.

The only way that your reading will affect you and stay with you is for you to react to it. Actively consider whether you agree with the ideas you read and how these ideas relate to questions you find personally important. As you read with greater care, your reactions will develop too. But whatever level you are reading at, you need to ask yourself in many different ways: What do I think about this idea? How true is it? How important is it to me? Does it challenge anything I already believe? Does it raise questions or answer questions?

When you react to your reading, you start to make a link between the ideas suggested by the page and what happens in your mind – your responses. This link is essential for any kind of intellectual work. The writer's words touch our minds; soon we will have something to say in reply. Because your reactions pass so quickly, turning your responses into words will help you hold on to them. Both writing notes in the margins of your books and keeping a reading journal will help you remember and develop your thoughts about reading. Thus the reader becomes a writer.



Academic skills: tips and techniques

ANNOTATION

The way to begin sorting your first reactions to your reading is to put them in words - either by talking or by writing. However, you may not always have a friend at hand. A more realistic practice is to confide in yourself, writing down your thoughts, reactions, and questions as they occur to you in the margin of your book - next to the passage that triggered the response. When you reread the book at a later date, you will know what you liked and what you did not, what reminded you of a personal experience, and which ideas stimulated your interest and curiosity. In case you were not sure just what you thought back then, you can sort out the many directions of your earlier thoughts when you return for a second look.

With pencil in hand, ready to comment on your reading, you may find you want to make two different kinds of remarks: some to help you understand the meaning of the text more fully and others to express your own reactions, evaluations, and associations. It is a good idea to keep the two kinds of comments separated. For example, you may put comments on the meaning in the narrower margin near the book's spine and leave all the other margins for reactions.

Annotations to clarify. You may use annotations for meaning as a study technique. Underlining key statements, numbering supporting arguments, defining unusual words, and paraphrasing difficult passages all help you approach the surface meaning of a text. But annotations can go more deeply to establish the connections and logic of the entire selection. In the margin you can explicitly state underlying assumptions of the text - that is, ideas only indirectly suggested by the original. Where the meaning of words or structure is unclear, a well-placed question mark even better, a purposeful question will remind you of what is puzzling.

Annotations to evaluate. On the second level of annotation, your thoughts interact with the ideas suggested by the text. Feel free to express the most outrageous opinions in the most informal way. Probably no one but you will see these comments, so allow yourself freedom. Any type of phrase, mark, smudge, or sign that conveys your attitude is legitimate. With this freedom you will eventually find your own topics, your own things to say. Here you can see some typical kinds of comments that may help you to get started:

approval and disapproval	????, NO!, not bad, exactly, yecch, nonsense, right
disagreements	I can't agree because ..., no, the actual facts are...
exceptions	this doesn't hold for the case of...
counterexamples	isn't case x just the opposite?
supporting examples	this is exactly what happens in case y
extensions	this could even apply to...
discoveries	this explains why...
possible implications	would this mean that..?
personal associations	my uncle acts just like that...
reading associations	Z in his book argues the same thing
distinctions	but it's not like Z's argument because...

As soon as you get into the spirit of annotation, you can throw out all these suggestions and develop comments most appropriate to the way you think.



Practice clip



1. *Read the following passage and annotate it to clarify*

Until recently, most scientists did not take longevity research very seriously. Even today, in many parts of the scientific community, anti-aging research is viewed as science fiction posing as science. But scientists at some of the most prestigious universities and biomedical research institutes in the world are looking for ways to extend the length – and improve the quality – of human life. While few of these scientists confidently predict that their work will end aging or dramatically prolong the human life span, many are cautiously optimistic about the prospect of making significant progress in the coming decades.

Scientists do not know exactly why people age and die. They understand many of the mechanisms that lead the body to break down and stop working over time, but the underlying causes of aging are still a mystery. One popular theory holds that humans are essentially programmed to die after they are no longer needed to raise the children they produce. According to this theory, evolution has ensured that people are strong during their fertile years so they can produce and rear offspring, but this bodily vigor subsides after the reproductive and parenting years are over.

In the last 200 years, advances in medicine, nutrition and public health have substantially increased human life spans. But these increases have been achieved largely by helping more children live to adulthood and old age rather than by pushing the boundaries of human aging well past their known limits, which most experts put at about 120 years.

Today, a host of companies offer different treatments, from human growth hormone (HGH) to testosterone, aimed at helping people turn back the clock. But these therapies have been widely shunned by the mainstream medical community and, so far, they have not been scientifically shown to lengthen a person's life span in any meaningful way. Some, like HGH, are alleged to be detrimental to long-term health.

Most gerontologists predict that the average life span in the developed world will continue to grow steadily and slowly. For example, in the U.S., life expectancy is projected to increase from roughly 78 today to 83 in 2050. In addition, the number of people who live past 90, or even 100, will continue to grow rapidly. Without a doubt, the world is getting grayer.

2. *Annotate the texts below to evaluate. Include comments about the following: Are the facts true? Do I agree with the opinions? Is the information trustworthy?*

- a) Global warming affects most people in the world, especially those living in the low-lying areas near the sea. It has been predicted that the melting of polar ice may cause the sea to rise by as much as twelve metres by 2050. This would cause flooding in many major coastal cities, such as Tokyo. It has been suggested that the best solution to this problem may be for mankind to become amphibious, like frogs. It is argued that life was originally found in the sea, and so it would merely be a return to our original habitat.
- b) There is significant new evidence of the effects of heavy alcohol consumption by young people. In Britain in 2010 nearly 800 people under 44 died from cirrhosis of the liver, a condition that is mainly caused by excess drinking. This is over four times higher than the number in 1980. The growing problem seems to be due to "binge" drinking among the young, when drinkers deliberately set out to get drunk. As a result the government is studying the possibility of compulsory health warnings on alcohol advertising.