


	<b>Syllabus</b> <i>Course Program</i>	
<b>Foreign Language</b>		

<i>Specialty</i> 105 – Applied Physics and Nanomaterials	<i>Institute</i> Educational-Scientific Institute of Computer Modeling, Applied Physics, and Mathematics
<i>Educational program</i> Applied Physics and Nanomaterials	<i>Department</i> Department of Cross-Cultural Communication and Foreign Language (276)
<i>Level of education</i> Bachelor's level	<i>Course type</i> General Training, Mandatory
<i>Semester</i> 1-6	<i>Language of instruction</i> English

## Lecturers and course developers

	<p><b>Olena Zemliakova</b></p> <p><a href="mailto:olena.zemliakova@khpi.edu.ua">olena.zemliakova@khpi.edu.ua</a></p> <p><i>Candidate of Philological Sciences, Associate Professor, Associate Professor of the Department of Intercultural Communication and Foreign Languages at NTU "KhPI", author of over 40 scientific and scientific-methodological works. The main courses taught include "Foreign Language", "Foreign Language for Professional Training", and "Foreign Language for Professional Orientation."</i></p> <p><u><a href="https://web.kpi.kharkov.ua/mkia/vykladachi/zemlyakova-olena-oleksandrivna/">More about the lecturer on the department's website</a></u></p> <p><u><a href="https://web.kpi.kharkov.ua/mkia/vykladachi/zemlyakova-olena-oleksandrivna/">https://web.kpi.kharkov.ua/mkia/vykladachi/zemlyakova-olena-oleksandrivna/</a></u></p>
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## General information

### Summary

*The study of foreign languages is a necessary and integral part of general educational professional training of bachelors. This is due to the internationalization of communication, the development of cooperation of specialists at the global level. Therefore, when learning a foreign language, the priority is to know the structures and strategies of professional discourse, forms and means of communication, as well as the skill to operate them. The course of learning a foreign language is, therefore, professionally oriented and communicative. The discipline is aimed at the integrated implementation of practical, educational, developmental and educational goals.*

*Foreign Language*



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## Course objectives and goals

*The purpose of teaching the discipline "Foreign Language" is to prepare students for effective communication in their academic and professional environment. The main tasks of studying the discipline are mastering at the appropriate level four types of speech activity in oral (listening and speaking) and written (reading and writing) forms; the use of sociocultural knowledge and skills in foreign language communication; assessment and analysis of their own educational experience and improvement of their educational strategies.*

## Format of classes

*Workshops, self-study, consultations. Final control in the form of a test for the 1st, 5th, and 6th semesters, for the 2nd semester - examination.*

## Competencies

*GC 8: Ability to work with information: finding, evaluating, and utilizing information from various sources necessary to solve professional tasks.*

*GC 10: Ability to effectively communicate, taking into account the goals and the communication situation.*

*GC 11: Ability to carry out professional activities in an international environment.*

## Learning outcomes

*LO 4. To have knowledge of the fundamentals of profession-oriented disciplines in the specialization. To possess knowledge and skills in conducting experiments, data collection, and modeling in computer systems.*

## Student workload

*The total volume of the course is 240 hours (12 ECTS credits): workshops - 116 hours, self-study - 124 hours.*

## Course prerequisites

*To successfully complete the course, it is necessary to have knowledge and practical skills acquired when getting secondary education.*

## Features of the course, teaching and learning methods, and technologies

*In order to activate the educational and cognitive activity of students, the use of both active and interactive educational technologies is provided, including individual and team work, issue-oriented lectures, mini-lectures, work in small groups, seminars-discussions, brainstorming, case studies, presentations, gamification, project works, scenario method, etc.*

## Program of the course

### Topics of the lectures

*No lectures.*

### Topics of the workshops

#### Semester 1

*Topic 1: Technologies in Our Life. Introduction to the course content. Introduction to vocabulary (terminology). Structure of a simple sentence (declarative). Narrative sentence and its structure.*

*Topic 2: Technological Achievements of Humanity. Types of subjects and predicates in a simple sentence. Object, attribute, and adverbial in a simple sentence.*

*Topic 3: Material Technology. Vocabulary for materials and their properties. Interrogative sentences and their formation. Imperative sentences and the formation of the imperative.*

*Foreign Language*



*Topic 4: Components and Assemblies. Discussing the future of materials physics. Past Simple Active. Future Simple Active.*

## **Semester 2**

*Topic 5: Features of Nanotechnology and Nanodevices Development. Present Continuous Active, be going to. Past Continuous Active. Future Continuous Active.*

*Topic 6: Shapes and Three-Dimensional Objects. Passive voice. Simple Passive.*

*Topic 7: Dimensions and Measurement Accuracy. Continuous Passive. Perfect Passive.*

*Topic 8: Stages of the Design Process. Modal verbs of the 1st group (can, may) and their equivalents (be able, be allowed, be permitted, be forbidden).*

## **Semester 3**

*Topic 9: Technical Issues. Evaluation and interpretation of malfunctions. Modal verbs of the 2nd group (must, needn't, should, ought to) and their equivalents (be, have). Modal verbs of the 3rd group (must, can't, should, may, might, could).*

*Topic 10: Technologies for Diagnosing Nanomaterials and Nanodevices. Modal verbs with complex forms of the infinitive. Functions of the verbs "to be" and "to have".*

*Topic 11: Technical Requirements. Ideas and Solutions. Structure of a complex sentence. Complex-compound sentences, conjunctions. Coordination sentences.*

*Topic 12: Evaluation of Technical Feasibility of a Project. Description of improvements and redesign. Indirect speech, sequence of tenses. Indirect declarative sentences. Indirect questions.*

## **Semester 4**

*Topic 13: Hazardous and Harmful Factors in Production. Types of protective measures. Conditional mood. Types of conditional sentences (I, II, III).*

*Topic 14: Regulations and Standards. Instructions and notifications. Functions of the verb "should". Participle I. Forms and functions.*

*Topic 15: Automated Systems. Participle II. Forms and functions. Participle phrases (complex object, absolute participle).*

*Topic 16: Monitoring of Production Processes. Gerund. Forms and functions. Gerundial phrases.*

## **Semester 5**

*Topic 17: Personality. Publicity. Media. Digital media.*

*Topic 18: Problems. Personal issues. Feelings. Crimes.*

*Topic 19: Traditions and Customs. Culture. Verbal and non-verbal communication.*

*Topic 20: American English and British English. Differences and common features.*

## **Semester 6**

*Topic 21: Vacation and Tourism. Types of active leisure. Travels.*

*Topic 22: Relationships. Relations. Interpersonal connections.*

*Topic 23: Health. Nutrition. Illnesses. Treatment.*

*Foreign Language*



Topic 24: Healthy Lifestyle. Healthy Nutrition. Physic's Health.

## **Topics of the laboratory classes**

*No laboratory classes.*

### **Self-study**

*Self-study includes preparation for workshops, independent study of topics and issues that are not taught in workshops, and completion of an individual task.*

*Topics of individual tasks (project work):*

### **Semester 1**

- 1. Nanotechnology and Nanophysics: Discoveries and Perspectives*
- 2. What Can Nanotechnology Do?*
- 3. Nanotechnology and Its Role in Understanding the Present Reality*
- 4. Physics of the Future: What Is It?*
- 5. Physics in Everyday Life*
- 6. Innovations in Science*
- 7. The Importance of Prototyping in Science*
- 8. The Future of Materials Physics*
- 9. Inorganic Nanomaterials*
- 10. Carbon Nanoscale Materials*

### **Semester 2**

- 11. Nanocomposite Materials*
- 12. Nanobiotechnology*
- 13. Micro and Nanodevice Manufacturing Technologies*
- 14. Contemporary Space Exploration*
- 15. Nanotechnology for Space Applications*
- 16. Physics Today*
- 17. The Role of Physics in the Development of Medical Technologies*
- 18. Nanoelectronics and Its Impact on Modern Information Technology*
- 19. Utilization of Nanomaterials in Solar Energy Systems*
- 20. Nanotechnology in Architecture and Construction*

### **Semester 3**

- 21. Physics and Energy: Exploring New Sources and Efficient Utilization*
- 22. The Role of Nanomaterials in the Development of Environmentally Friendly Technologies*
- 23. Biological Applications of Nanotechnology*
- 24. Utilization of Nanomaterials in Electronics Manufacturing*
- 25. Nanotechnology and Biomedicine: Progress and Perspectives*
- 26. The Impact of Nanomaterials on the Environment and Safety*
- 27. Nanophotonics and Its Applications in Optical Technologies*
- 28. Nanotechnology in the Food Industry: Advantages and Challenges*
- 29. Quantum Physics and Its Applications in Information Technology*
- 30. The Role of Nanomaterials in the Development of Sensor Devices and Systems*

### **Semester 4**

- 31. Application of Nanomaterials in Modern Electronic Devices*
- 32. Photonics and Nanomaterials: Innovative Solutions for Optical Technologies*
- 33. Nanomaterials in Solar Energy Systems: Enhancing Efficiency and Stability*
- 34. Utilization of Nanomaterials in Electric Vehicle Battery Manufacturing*

*Foreign Language*



35. *Nanomaterials and Their Role in the Development of Organic Light-Emitting Diode (OLED) Displays*
36. *Smart Materials based on Nanomaterials: Perspectives of Application*
37. *Nanomaterials in Medicine: Utilization for Diagnosis and Treatment*
38. *Nanotechnology in Biomedical Implantation: New Possibilities and Challenges*
39. *Nanomaterials and Their Applications in Sensor Technologies for Health and Fitness*
40. *Nanotubes and Their Potential in Electronics and Energy Systems Development*

### **Semester 5**

41. *Recent Advances in Quantum Computing Technology and Their Potential Applications*
42. *Applied Physics in the Development of Nanorobots for Medicine and Microsurgery*
43. *Utilization of Laser Technologies in Industry and Medicine: Current Achievements and Perspectives*
44. *Superconductors in Modern and Future Electrotechnics: From Efficient Energy Systems to Quantum Computers*
45. *Applied Physics in the Development of High-Strength and Lightweight Materials for Aviation and Automotive Industries*
46. *Biomimetics and Applied Physics: Utilizing Natural Principles for the Development of New Technologies and Materials*
47. *Applied Physics in the Creation of Energy-Efficient Heating and Cooling Systems*
48. *Application of Photonics in Information Technologies: From Optical Communications to Quantum Communication*
49. *Applied Physics in the Development of Autonomous Systems and Robotics*
50. *Utilizing Applied Physics in the Production of Clean Energy: Solar, Wind, Geothermal, and Other Renewable Sources*

### **Semester 6**

51. *Application of Applied Physics in the Development of Modern Medical Equipment and Diagnostic Tools*
52. *Applied Physics and Nanomaterials in the Creation of Efficient and Environmentally Friendly Energy Systems*
53. *The Impact of Applied Physics on the Development of Transportation and Mobility: Electric and Autonomous Vehicles*
54. *Applied Physics in the Development of New Materials for Solar Panels and Improving Their Efficiency*
55. *The Role of Applied Physics and Nanomaterials in the Creation of Efficient Water Purification and Conservation Systems*
56. *Applied Physics in the Development of New Methods and Technologies for Information Storage and Transmission*
57. *Utilizing Applied Physics and Nanomaterials in the Development of Modern Materials for Electronics and Communication Systems*
58. *Applied Physics and Nanomaterials in the Creation of Innovative Lighting and Display Systems*
59. *The Role of Applied Physics in the Development of Wind Energy Storage and Utilization Technologies*
60. *Utilizing Applied Physics in the Advancement of Artificial Intelligence Systems and Smart Technologies*

## **Course materials and recommended reading**

### *Main course materials:*

1. *Academic Writing Course. R.N. Jordan, Longman, 2008.*
2. *Bonamy, David. Technical English 4. Course Book. Pearson Longman, 2011.*
3. *Cambridge English for Engineering. Mark Ibbotson, Cambridge University Press, 2008.*
4. *Career Paths English: Information Technology. Virginia Evans, Jenny Dooley, Stanley Wright, Express*

### *Foreign Language*



*Publishing, 2011.*

5. *Check Your English Vocabulary for Computers and Information Technology. Vocabulary Workbook. Jonathan Marks, A & C Black Publishers Ltd, 2007.*
6. *English for Emails. Oxford University Press, 2007.*
7. *English for Socialising. S. Gore, D.G. Smith, Oxford University Press, 2007.*
8. *English for Telephoning. Oxford University Press, 2006.*
9. *English Grammar in Use. R. Murphy, Cambridge University Press, 2006.*
10. *Esteras S. R. Infotech 4. English for computer users. Cambridge, 2009.*
11. *Esteras S. R. Infotech 4. English for computer users. Workbook. Cambridge, 2009*
12. *Exam Booster. Preperation for B2+ Level Exams. Virginia Evans, Jenny Dooley. Express Publishing, 2020.*
13. *Grammarway 3. Jenny Dooley, Virginia Evans. Express Publishing, 2020.*
14. *Grammarway 4. Jenny Dooley, Virginia Evans. Express Publishing, 2020.*
15. *Oxford English for Computing. Keith Boeckner, P. Charles Brown, Oxford University Press, 2005.*
16. *Professional English in Use ICT. For Computers and the Internet. Santiago Remacha Esteras, Elena Marco Fabre, Cambridge University Press, 2007.*
17. *Smith, Roger. English for Electrical Engineering in Higher Education Studies. Course Book. Garnet, 2014.*
18. *Solutions. Upper-intermediate. Student's Book/ Workbook. 3rd Edition. Tim Falla, Paul A Davies. Oxford University Press, 2017.*

*Additional materials:*

1. *Williams, E.Y. (2018) Presentations in English. Macmillan.*
2. *Grussendorf, M. (2017) English for Presentations. OUP.*
3. *Powell, M. (2012) Presenting in English. Thomson. Heinle.*
4. *Thomson, K. (2017) English for Meetings. OUP.*
5. *Thomson, K. (2018) English for Negotiations. OUP.*
6. *Murphy, R. (2012) English Grammar in Use. CUP.*
7. *Hewings, M. (2015) Advanced Grammar in Use. CUP.*
8. *Eastwood, J. (2016) Oxford Practice Grammar (inter). OUP.*
9. *Yule, G. (2016) Oxford Practice Grammar (adv). OUP.*
10. *Oxford Business English Dictionary. (2015) OUP.*

*Internet-resources:*

1. [www.oup.com](http://www.oup.com)
2. [www.pearsonlongman.com](http://www.pearsonlongman.com)
3. [www.cambridge.org](http://www.cambridge.org)
4. <http://www.bbc.co.uk/worldservice/learningenglish/>
5. <http://learningenglish.voanews.com/>
6. *Index of Economic Freedom: Promoting Economic Opportunity and Prosperity by Country (heritage.org)*



## Assessment and grading

Criteria for assessment of student performance, and the final score structure	Grading scale		
	Total points	National	ECTS
<p>100% Final assessment as a result of a test (20%) and continuous assessment (80%).                      20% test: project work and its oral presentation                      80% Continuous assessment:                      20% test papers                      30% workshops;                      20% self-study                      10% individual tasks</p> <p>100% Final assessment as a result of an exam (20%) and continuous assessment (80%).                      20% exam: project work and its oral presentation                      80% continuous assessment:                      20% test papers                      30% workshops;                      20% self-study                      10% individual tasks</p>	90–100	Excellent	A
	82–89	Good	B
	75–81	Good	C
	64–74	Satisfactory	D
	60–63	Satisfactory	E
	35–59	Unsatisfactory (requires additional learning)	FX
	1–34	Unsatisfactory (requires repetition of the course)	F

## Norms of academic integrity and course policy

The student must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": to demonstrate discipline, good manners, kindness, honesty, and responsibility. Conflict situations should be openly discussed in academic groups with a lecturer, and if it is impossible to resolve the conflict, they should be brought to the attention of the Institute's management.

Regulatory and legal documents related to the implementation of the principles of academic integrity at NTU "KhPI" are available on the website: <http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/>

## Approval

Approved by	Date, signature	<i>Head of the department</i> Tetyana Sergeyeva
	Date, signature	<i>Guarantor of the educational program</i> Vadym STARIKOV