# ЕКОНОМІКА. ЗЕМЛЕВПОРЯДНА ОСВІТА І ВИРОБНИЦТВО

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# ENGLISH IN HIGHER EDUCATION OF SURVEYORS AND LAND MANAGERS IN UKRAINE: TODAY'S CHALLENGES

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***Abstract.*** *An overview and application of the English language in the world at the modern stage were conducted. The key importance of the English language for international business and scientific communication was clarified. The prerequisites for the use of the English language in Ukraine and its legislative support at the current stage were considered. The content and scope of the discipline "Professional foreign language" in the training program for specialists in specialty 193 "Geodesy and land surveying" were determined. The cycle "education – science – production" regarding the use of the English language in the specified specialty was analyzed.*

*At the education stage, the need to achieve the B2 level is substantiated both for the possibility of barrier-free implementation of international academic mobility during studies, and for the possibility of its continuation at the following educational and qualification levels of higher education (master's degree, doctor of philosophy). The scientific stage reveals the terminological problems and the importance of working with professional specialized literature for the formation of publishing activity and other criteria related to the knowledge of a foreign language, necessary for obtaining academic degrees. The production moment examines the English language through the prism of working with technical and technological support necessary for carrying out topographic-geodetic, cartographic and land-cadastral works.*

***Keywords:*** *English language, geodesy, globalization, European integration, land surveying, international academic mobility, education.*

## *Topicality*

According to The Economist magazine in the early 2000s English was positioned as a native language by 380 million people, and approximately 2/3 as a second language. A billion of the world's population learn English, and about a third use it. It is expected that by 2050 half of the world will own it [1].

On November 16, 2015, the English language was identified as one of the priorities of the development strategy by Presidential Decree No. 641/2015 in support of the Go Global program and 2016 was declared the Year of the English Language in Ukraine [2]. On June 17, 2023, the government announced the preparation of draft law No. 9432 "On the use of the English language in Ukraine" [3], which provides for the recognition of English as the language of international communication and developed measures to increase the accessibility of learning this language.

According to paragraph 2 of the resolution of the Ministry of Education and Culture of Ukraine dated March 11, 2015 No. 1/9-120, higher educational institutions are obliged to "... create conditions for learning English as the language of international academic communication in order to achieve B2 level by university graduates in accordance with the All-European recommendations on language education" (Common European Framework of Reference for Languages: Learning, Teaching, Assessment – hereinafter CEFR).

Earlier, the English language was studied in universities, so to speak, "as a reserve", or at all, young people did not see the prospect of studying it, but now it is a necessity. Many students, due to the war in Ukraine, ended up in different countries and were forced to adapt to other living conditions, where English became a means to learn other languages, access information, meet peers or even help parents in solving everyday issues: filling out forms, job search, ticket purchase, etc. The war in Ukraine and the increasingly clear prospects of joining the EU open eyes to the importance of mastering a foreign language in a new way [4].

Polish expert Katarzyna Spiridakis notes that the absence of obstacles in traveling through European countries is a great incentive for learning foreign languages [5].

These issues are important primarily for more than 7,000 higher education students who annually study at the first and second levels of higher education in the specialty 193 "Geodesy and land surveying" [6], scientific and pedagogical workers who provide professional training, and numerous employers who expect high-quality human resources [7].

Data from the study "Graduates of Ukrainian universities through the eyes of employers" prove that the largest number (46%) of graduates feel that they have insufficient knowledge of foreign languages. Then, only every fourth graduate (≈25%) lacks professional skills [8].

## *Analysis of recent research and publications*

On June 17, 2022, the European Commission recommended granting Ukraine the status of a candidate for

EU membership, and on June 23, 2022, during the summit of EU leaders, it was officially received.

Having the status of a European state implies the support of some norms of Western society, one of which is the knowledge of two foreign languages, in addition to the native one, by EU citizens. In particular, EU citizens have grown to understand that the growing level of economic, social and cultural integration requires a greater level of linguistic harmony. Policy in the field of teaching foreign languages, which is defined as a separate area of EU language policy, is aimed at achieving this goal. Promoting the study of foreign languages in the EU has long been a separate activity of the European Commission, which has its own name – Language Learning Policies. The European Commission uses three languages for internal purposes – English, French and German [9].

The governments of European countries recognize or are forced to recognize the exceptional role of the English language in the field of international cooperation [10]. According to the results of the study "The Future Demand for English in Europe: 2025 and beyond", the current educational policy of the EU is aimed at increasing the level of English language proficiency among the population, and it is unlikely that this policy will change significantly by 2025 [11].

According to [10] both internal EU statistical data and external research initiated by the British Council in seven EU member states, English will remain the main foreign language, at least in the near future, despite a number of valid reasons. Even after the initialization of the procedure for the withdrawal of Great Britain from the EU (Brexit) on January 31, 2020, the demand for learning English in France and Germany, on the contrary, has increased.

## *Outline of previously unresolved parts of the general problem*

The content of land surveying and geodetic education in Ukraine was considered in the works of domestic scientists, in particular V. Borovyi, Y. Dorosh, I. Kovalchuk, A. Martyn, A. Tretyak, T. Yevsyukov. However, works in the context of "education – science – production" were practically absent [12]. Specialty 193 "Geodesy and land surveying" within the field of knowledge 19 "Architecture and construction" appeared in the List of fields of knowledge and specialties for which higher education applicants are trained, which was approved by the Resolution of the Cabinet of Ministers of Ukraine dated April 29, 2015 No. 266. The content of the subject area of specialty 193 "Geodesy and land surveying" is disclosed in [13], taking into account subsets of the subject area (specializations): Geodesy; Aerospace Earth Research, Photogrammetry and Geoinformatics; Cartography; Land Cadastre, Land Surveying; Land Administration. The authors emphasize that they consider the "subject area of the field of knowledge" as a set of all subjects, the properties of which and the relationship between them take place in the relevant scientific theory. The given list of subject orientation is highly specialized and does not contain a foreign language.

The recently adopted (Order of the Ministry of Education and Culture No. 517 dated 11.05.2021) standard of higher education for the first (bachelor) level and the draft standard for the second (master) level of specialty 193 "Geodesy and Land Surveying" envisage, at

the level of general competencies and expected program learning outcomes, the ability to communicate orally and in writing in a professional foreign language, leaving the amount of training required for this at the discretion of the institution of higher education, which conducts educational activities and is of a recommendatory nature.

***The aim of the study.*** To reveal the meaning, necessary volume and effective methods of learning English for the professional activities of future specialists in the specialty 193 "Geodesy and Land Surveying".

## *Research materials and methods.*

The scientific article used the methods of scientific knowledge: monographic, generalization, analysis, systematization. Scientific works of domestic and foreign researchers were analyzed using the monographic method. The method of generalization formed the meaning and status of the English language as an international language for the state, as well as for certain integration associations and the world in general. The method of analysis compared the educational load for learning professional English in some institutions of higher education at different educational and qualification levels. The method of systematization made it possible to reduce scattered cases of the use of the English language into a cycle consisting of the stages "education – science – production". When forming conclusions, the method of idealization and the technique of argumentation were used.

## *Research results and their discussion*

Education. Applicants, who want to study at a bachelor's degree in the specialty 193 "Geodesy and Land Surveying", are faced with a foreign language (including English) at the admission stage, as with one of the list of subjects that has a certain coefficient when calculating the competitive score (in 2023 – 0.25; in 2021 – 0.25; etc.).

When entering a master's program, the vast majority of master's programs require a single entrance exam (EVI) in a foreign language (English, German, French, or Spanish) of your choice. The EVI program was created taking into account the CEFR and corresponds to levels B1-B2 according to its scale (Table 1).

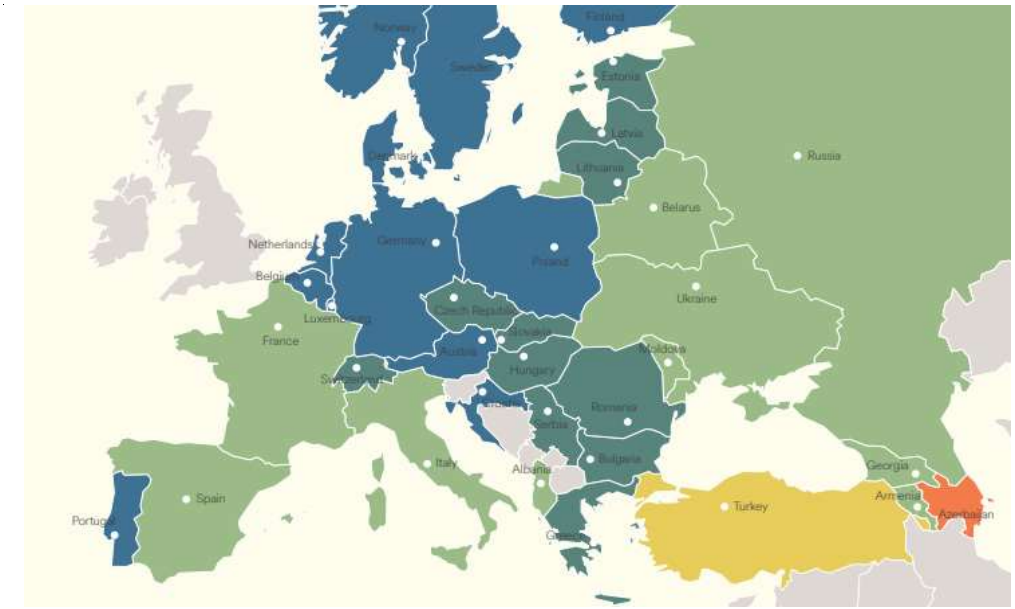
Competitive selection for study at the third educational and scientific level of the doctor of philosophy, in addition to passing the exam in the specialty, also includes an exam in a foreign language. The Standard Admission Rules provide for an exemption from the entrance exam in a foreign language (English) if the level is confirmed by valid TOEFL or International English Language Testing System test certificates or a Cambridge English Language Assessment certificate not lower than level B2 on the CEFR scale.

On February 9, 2023, the Ministry of Education and Science of Ukraine, the Ministry of Culture and Information Policy of Ukraine and the Association of Innovative and Digital Education presented the start of the National Ecosystem for the Study and Testing of English Language Proficiency for Ukrainians within the Roadmap for the Introduction of English as the Language of International Communication in Ukraine [14].

An alternative to testing the level of English for non-native speakers is the free adaptive standardized online test (EF Standard English Test). The language abilities of test takers are classi-

**Table 1. CEFR scale of English language proficiency levels**

| Level name | Level | Name of level groups | Level groups |
|---|---|---|---|
| Competent | C2 | Proficient user | C |
| Autonomous | C1 | | |
| Advanced | B2 | Independent user | B |
| Boundary | B1 | | |
| Intermediate | A2 | Basic user | A |
| Introductory | A1 | | |




**Legend:**

| # in the world | Country | EF EPI | CEFR level |
|---|---|---|---|
| 01 | Netherlands | 661 | C1 |
| 03 | Austria | 628 | C1 |
| 04 | Norway | 627 | C1 |
| 05 | Denmark | 625 | C1 |
| 06 | Belgium | 620 | C1 |
| 07 | Sweden | 618 | C1 |
| 08 | Finland | 615 | C1 |
| 09 | Portugal | 614 | C1 |
| 10 | Germany | 613 | C1 |
| 11 | Croatia | 612 | C1 |
| 13 | Poland | 600 | C1 |
| 14 | Greece | 598 | B2 |
| 15 | Slovakia | 597 | B2 |
| 16 | Luxembourg | 596 | B2 |
| 17 | Romania | 595 | B2 |
| 18 | Hungary | 590 | B2 |
| 19 | Lithuania | 589 | B2 |
| 21 | Bulgaria | 581 | B2 |
| 23 | Czech Rep. | 575 | B2 |
| 25 | Latvia | 571 | B2 |
| 26 | Estonia | 570 | B2 |
| 27 | Serbia | 567 | B2 |
| 29 | Switzerland | 563 | B2 |
| 32 | Italy | 548 | B2 |
| 33 | Spain | 545 | B2 |
| 34 | France | 541 | B2 |
| 35 | Ukraine | 539 | B2 |
| 39 | Belarus | 533 | B2 |
| 40 | Russia | 530 | B2 |
| 42 | Moldova | 528 | B2 |
| 45 | Georgia | 524 | B2 |
| 47 | Albania | 523 | B2 |
| 57 | Armenia | 506 | B2 |
| 64 | Turkey | 495 | B1 |
| 92 | Azerbaijan | 440 | B1 |

Classification groups: Very high; High; Average; Low; Very low

**Fig. 1. Index of the level of English language proficiency across European countries as of 2022 (according to [15])**

**Table 2. Time calculations for learning English from level A1 to C2 under different conditions (for adults)**

| Level name | Number of hours to complete this level from the level below | Number of hours to complete this level from scratch | Number of weeks to study a lower level, with 2 hours of classroom instruction and the same amount of independent work each week | Number of additional study hours per week to complete the level in 35 weeks (academic year) |
|---|---|---|---|---|
| C2 | 300-400 | 1030-1450 | 75-100 | 5-7 |
| C1 | 200-300 | 730-1050 | 50-75 | 2-5 |
| B2 | 180-260 | 530-750 | 45-65 | 1-3 |
| B1 | 160-240 | 350-490 | 40-60 | 1-3 |
| A2 | 100-150 | 190-250 | 25-38 | 0 |
| A1 | 90-100 | 90-100 | 23-25 | 0 |

fied according to one of the 6 levels established by the CEFR (see Table 1). EF EPI 2022 scores are highly correlated with TOEFL 2020 scores (r = 0.81) and IELTS Academic Test 2019 scores (r = 0.75). The correlation values show that despite the different design of the tests and the different profiles of the participants, they reveal similar trends in the national levels of English language proficiency (Fig. 1) [15].

Europe has the highest level of English proficiency of any region. Since 2011, it has also shown steady progress. Adults over 40 are improving much faster than other age groups in Europe. Recently, the large, low-productivity countries bordering the EU have made the largest contribution to the growth of the regional average. There is potential for further development in the EU, as France, Spain and Italy, the region's three largest economies, still lag behind their neighbours.

An important factor in the successful mastery of a language is the number of hours provided for in the curriculum of higher education institutions. The study, teaching and use of the English language in higher education institutions of Ukraine is carried out in accordance with the "Conceptual foundations of the state policy on the development of the English language in the field of higher education" and CEFR recommendations. As a rule, in non-linguistic higher education institutions, the study of a foreign language is insufficient from the minimum required. According to experts, in order to learn a foreign language from scratch or from level A1 to level B2 (Table 2), at least 750 hours are needed [16].

According to the data of the unified state electronic database on education, as of 01.01.2021, 45 subjects of educational activity were registered, which carried out the training of students of higher education at the first (bachelor's) [17]; 37 – at the second (master's); 5 – at the third (educational and scientific) level of higher education in specialty 193 "Geodesy and Land Surveying" [12]. The duration of studying a foreign language differs significantly depending on the institution and level of higher education (Table 3). If the student provides an international certificate confirming this level of English language proficiency (not lower than B2), such a student (if desired) is exempted from studying this discipline.

Double degree programs and in general any other type of international

**Table 3. Scope of studying English in specialty 193 in the section of some higher education institutions of Ukraine at different levels of higher education (in ECTS and hours)**

| ZVO OKR | Lesya Ukrainka VNU | KNUBA | LNUP (LNAU) | NU «Lviv Polytechnic» | KhNUMH named after O.M. Beketov | ChNU named after Y. Fedkovych |
|---|---|---|---|---|---|---|
| Bachelor | 10 / 300 | 6,0 / 180 | 11,0 / 330 | 11,0 / 330 | 7,0/210* | 6,0 / 180 |
| Master | 3,0 / 90 | 3,0 / 90 | 3,0 / 90 | 3,0 / 90 | n/a | 3,0 / 90 |
| Doctor of Philosophy | 8,0 / 240 | 6,0 / 180 | 8,0 / 240 | 3,0 / 90 | 6,0 / 180 | × |

* It is possible to increase by 4 credits due to the discipline of free choice
n/a - no data freely available
× – training at the third educational and scientific level of higher education is not carried out.

academic mobility are difficult to implement without knowledge of a foreign language. Studying under "dual diploma" programs allows students to receive two diplomas at the same time: the Ukrainian state model of one of the proposed foreign partner institutions of higher education under a joint educational program.

The functional capabilities of modern computer and communication technologies provide the educational process with the realization of a number of opportunities that can contribute to improving the quality of education. In a foreign practice, such an understanding of learning technologies is based on the active use of computers and information technologies. Computer learning technologies include: Computer Aided Instruction, Computer Aided Learning, Computer Based Learning, Computer Based Training and Computer Aided Assessment [18].

Web tools and the spread of the Internet have made it possible to combine different types of computer-based learning technologies and increase their level of accessibility and coverage. The COVID-19 pandemic has become a serious challenge for Ukrainian higher education institutions in terms of checking their readiness to work online. Currently, distance education is the main form of the educational process, which provides safe conditions for communication between students and teachers. The perspective of distance learning technology contributed to the emergence of numerous platforms with different technical capabilities and functional components: IBM (Learning Space), Oracle (i-Learning), e-Learning, MOODLE, ATutor, Dokeos, Claroline, etc. However, in Ukraine, the free MOODLE system has become the most common based on the Open Source principle under the terms of the GNU/GPL license [19; 20].

One of the newest forms of distance learning is mass open online courses (MOOC). Free and accessible to anyone without any restrictions, they can help higher education institutions and applicants take a step towards meeting modern technologies.

The most popular platform MOOC is Coursera. A separate section is devoted to the study of languages there. In particular, you can specify the desired language of study, the expected level and the language of subtitling materials. Useful free English language courses are found with relative ease:

- Lesson | Small Talk & Conversation Vocabulary;
- Lesson | Express Yourself: Pronunciation;
- Lesson | Understand and Be Understood on the Phone;
- Lesson | Videos Conferencing: Face to Face but Online;
- Lesson | Business English Skills: How to Write Effective Openings and Closing Emails;
- Lesson | Business English Skills: Introducing Yourself in Business Settings;
- Lesson | Business English Skills: How to Navigate Tone, Formality, and Directness in Emails.

"Prometheus" is a public project of mass open online courses. In cooperation with teachers of the best higher education institutions of Ukraine, many courses have been created and placed on its own platform. The ability for universities, organizations and leading companies to publish and distribute courses on this platform has been given free of charge. Among the interesting and useful, in our opinion, we highlight the following:

- Course | English for beginners. Elementary level (A1-A2);
- Course | English for STEM (Science, Technology, Engineering and Mathematics);
- Course | English for career growth;
- Course | Business English.

MOOC are carried out according to educational programs and do not provide for the awarding of educational qualifications specified by the state according to the level of education, and therefore the learning results obtained through non-formal education are recognized in the formal education system in the manner determined by the legislation (according to the relevant Regulations on the interaction of formal and non-formal education, recognition of the learning results obtained through non-formal and/or informal education in the formal education system).

The experience of introducing bilingual education (bilingual education) is interesting – education in the process of which two languages are used – native (first) and second (foreign). The forms of using two languages, as well as the types of teaching and methodical materials and their language are not regulated, but their level must correspond to the average language competence of the group of students.

Bilingual education does not include restrictions on educational disciplines of geodetic and land surveying (higher geodesy, satellite geodesy, organization and management of geodetic production, photogrammetry and remote sensing, etc.), but includes restrictions on the initial level of students' foreign language training. That is why it is suggested to start studying in bilingual conditions in the senior courses of bachelor's training. For example, during the study of academic disciplines, the student masters English geodetic terminology: Terrestrial Coordinate System; major axis of reference ellipsoid; first meridian ellipse eccentricity; geodetic height relative to the surface station observations ellipsoid; Global Navigation Satellite System (GNSS); coordinate transformation for plotting points by GNSS methods; permanent reference station.

Science. English has undoubtedly acquired the status of a lingua franca – that is, the language of international communication. The remarkable role of the English language (in particular, as a means of international scientific communication, actually the transnational language

of science) is evidenced by the following facts: more than 90% of scientific publications in information technologies and linguistics are published in English, in other fields – 70-85% [21; 22].

Any program of studying a foreign language at the postgraduate level assumes that by the end of the studies, the young scientist should master all types of speech activity, namely, reading, writing, speaking and listening.

Learning English in the absence of a language environment is quite a difficult task. But if learning the basics of a spoken foreign language, in particular English, has very old traditions and does not cause great difficulties due to the availability of a significant number of textbooks, methodical materials, as well as various dictionaries, then learning professional (specialized) English (ESP – English for Specific Purposes: EAP – English for Academic Purposes, EST – English for Science and Technology), is still unsatisfactory. Individuals who are graduates of non-philology majors and must improve their professional English skills to the level of passing the candidacy exam in a foreign language in a fairly limited period of time will face serious obstacles. In addition to purely terminological bilingual or multilingual dictionaries of terms of a certain specialty, those who study a professional foreign language need a dictionary (actually a minimum dictionary) of general scientific lexicon, actually a lexicon of the metalanguage of science, which was developed by the author in [23].

One of the most dynamic and terminologically rich spheres of human activity is the field of geodesy, which in turn is closely related to mathematics, physics, radio electronics, radio engineering, geophysics, astronomy, cartography, geography, geomorphology, geoinformatics.

As noted by D. Chernetskyi in [24], the biggest problem of translating English terms in geodetic texts is based on inter-branch and intra-branch homonymy. In order to prevent errors related to the homonymous nature of the term, the translator must have background knowledge in fields related to the geodetic sphere (mentioned above), be knowledgeable in the subject matter of a specific task, in order to avoid choosing the wrong version of the translation of the term.

The terminology of cadastre and cartography has several sources of origin. This is, first of all, a national basis, as well as a huge number of borrowings, the largest part of which are Greekisms and Latinisms, because, as it is known, these languages were considered universal in almost all spheres of human life [25].

This terminology is characterized by a tendency to use multi-component models (terms-phrases, which include four, five, six or even more components), which is explained by the desire to express new differential features and increase their semantic accuracy. Due to the introduction of a new component into the phraseology, the concept of certain qualities of the subject, which distinguish it from a number of similar ones by special integral features, is expanded and deepened. However, regardless of the number of constituent components, the term remains a single sign. Phrasal terms express single integral concepts.

In the state standards on geodesy and cadastre, primarily four and five component terms-phrases (4%) are recorded, namely: technological plan of map edition, normal aspect of map projection, transversal system of polar spherical coordinates, oblique system of polar spherical coordinates, preparation

of map base editing original and others, which may contain prepositions (55%) or be used without them (45%) [26; 27].

Clarifying the peculiarities of terminology and English proficiency at the B2 level according to the CEFR scale allows:

- understand the main ideas of complex texts on abstract and concrete topics, including technical topics related to specialization;
- interact with a certain degree of fluency and immediacy, which makes regular interaction with native speakers possible without tension for each party;
- be able to make clear, detailed messages on many issues with the formulation of one's own view on the given problem, demonstrating the advantages and disadvantages of various options.

The scientific results of the dissertation submitted for the award of the Doctor of Philosophy degree must be covered in at least three scientific publications, which include articles in periodical scientific publications indexed in the Web of Science Core Collection and/or Scopus databases.

It is often believed that the final product of scientific work is a scientific report (dissertation). In the English-speaking world, the final product with scientific information is a publication in a journal indexed by scientometric databases (mainly Scopus or Web of Science). It is precisely for the sake of such publications that grant applications are written, and they report on the work performed during the reporting period. The number of scientometric articles is a criterion for forming a rating and further successful employment of a teacher or researcher in developed countries (frequent change of workplaces is characteristic of the lifestyle in the EU and the USA).

Publication in scientometric journals is a specific product, the value of which in the scientific world is determined by the number of references (citations) to it in other journals. Writing even a high-quality review article requires the processing of several hundred sources in foreign professional publications (mainly English-language) over the past few years.

The thesis submitted for defense can be written in the state language or in English. The public defense of the dissertation can be carried out in the official language or, at the request of the applicant, in English.

Scientists assign the titles of associate professor, professor in the scientific-pedagogical department, and senior researcher and professor in their specialty to scientific workers, taking into account:

- having certificates in accordance with the CEFR at a level not lower than B2 in the languages of EU countries or qualification documents (higher education diploma, scientific degree) related to the use of a foreign language or at least 10 works published in English in publications included to the scientometric databases "Scopus" or "Web of Science" and which have an ISSN number confirmed on the website of the International Center for Registration of Periodicals.
- confirmation of international experience with documents (certificates, certificates, diplomas, other documents), in particular about studies, internships or work at a higher education institution, scientific (or scientific and technical) institution in a country that is part of the Organization for Economic Cooperation and Development (OECD) and/or the EU.

Production. Rapid technological

changes in the field of topographical geodetic and land cadastral activities that have taken place during the last decades significantly affect the nature and content of the work to be performed by future engineers in the field of geodesy and land surveying [28].

Art. 171 of the Law of Ukraine "On topographic, geodetic and cartographic activity" and Art. 40 of the Law of Ukraine "On Land Surveying" defines the technical and technological support of topographic-geodetic and cartographic activity and land surveying, which is used practically every day by specialists for carrying out professional activities.

Technical support of topographic-geodetic and cartographic activity is based on the use of computer and information technology, technical means for performing topographic-geodetic and cartographic works.

The domestic market of geodetic equipment is formed mainly from representative offices and dealer companies of foreign manufacturers. The most famous electronic total station theodolites are offered by such instrument-making companies in the world as: Leica Geosystems (Switzerland), Trimble (USA), Sokkia (Japan), Topcon (Japan), Nikon (Japan), Foif (China), Pentax (Japan), Spectra Precision (USA ), South (China) and others. In addition, each of the companies is trying to diversify the product range with new models of devices, additionally supplementing them with new capabilities [29].

If we take all the equipment of satellite radio navigation systems of geodetic code 9015 as 100% and calculate their weight by country of manufacture, then it can be stated that 50% belongs to the USA, 22% to Switzerland, 16% to Japan. On the equipment market, you can find 10% of devices manufactured by China, a very small number (only 1%) of devices from Canadian and German companies [30].

The technological support of topographic-geodetic and cartographic activities is based on the use of modern information technologies and systems for the creation of geodetic, topographic and cartographic materials, collection, input, control, accumulation, storage, renewal, search, conversion, processing, display, issuance and transmission of data.

The basis of information support for topographical, geodetic and cartographic activities are automated systems designed for processing data from cadastral, topographic and other surveys and remote sensing, maintaining banks (bases) of geospatial data, forecasting, planning, designing, mapping, organizational management.

The global GIS market is represented by several large providers of GIS tools and services: ArcGIS (USA), Autodesk (USA), MapInfo (USA), Cadcorp (UK), Erdas Imagine (Sweden), GeoBase (USA), GRASS (USA), IDRISI (USA), ILWIS (Netherlands), QGIS (USA).

Complexes of GIS software and technical tools in combination with network services and the geodata themselves, which ensure the display of geodata on the Internet, make it possible to move to geoportal solutions. Their developers are practically the same as those of desktop programs.

It should be noted that almost all novelties of technical and technological support contain exclusively English-language instructions and interface. Localization into other languages takes quite a long time, during which certain versions and models start to be considered obsolete.

**Table 4. Online educational courses on the subject of GIS and cartography on the Coursera platform**

| Specialization | Course | Duration | Certificate / details |
|---|---|---|---|
| Geographic Information Systems (GIS) | 1. Fundamentals of GIS<br>2. GIS Data Formats, Design and Quality<br>3. Geospatial and Environmental Analysis<br>4. Imagery, Automation, and Applications<br>5. Geospatial Analysis Project | 4 months<br>10 hours / week | ☑ |
| GIS, Mapping, and Spatial Analysis | 1. Introduction to GIS Mapping<br>2. GIS Data Acquisition and Map Design<br>3. Spatial Analysis and Satellite Imagery in a GIS<br>4. GIS, Mapping, and Spatial Analysis Capstone | 2 months<br>10 hours/ week | ☑ |
| | Geographical Information Systems - Part 1<br><br>Geographical Information Systems - Part 2 | 3 weeks<br>6 hours / week<br>3 weeks<br>3 hours / week | ☑<br>coursera.org/learn/gis-1<br>☑<br>coursera.org/learn/gis-2 |
| | Spatial Data Science and Applications | 3 weeks<br>3 hours / week | ☑<br>coursera.org/learn/spatial-data-science |

MOOC on the Coursera platform will help to facilitate familiarity with working with modern technical and technological support. In particular, there are several dozen courses in English of various levels of complexity on the subject of GIS and cartography from the world's leading universities. Some of them are listed in the table. 4.

## *Conclusions and perspectives*

As a result of the rapid development of scientific and technical progress, the national and global market of engineering services is changing incredibly quickly. The current avalanche-like implementation of digital technologies in the field of geodesy, topography and cartography is an inevitable process, as its basis is the simplification of access to a huge information environment without special knowledge. Most institutions of higher education in Ukraine, lacking adequate personnel and technological support, continue to use outdated educational programs, and as a result reduce the competitiveness of future graduates. Almost every second graduate feels insufficient knowledge of the level of a foreign language.

According to the resolution of the Ministry of Education and Culture of Ukraine No. 1/9-120, a graduate must reach the level of knowledge of a foreign language corresponding to B2. Achieving such a level from scratch is possible on the condition of studying at the level of 530-750 hours, while applicants at the bachelor's level study at the level of 180-330 hours, depending on the higher education institution, which is undeniably insufficient. Further continuation of studies in the master's degree requires the regular passing of the EVI entrance exam. The successful completion of which should correspond to the B2 level, but in practice it is rarely achieved. Additional 90 hours "Professional foreign language" at the master's level does not improve the situation too much, and restrains the opportunities of education seekers to participate in international academic mobility.

It is proposed to use distance learning technologies, namely mass open online courses (MOOC), to effectively learn a foreign language. Popular platforms Coursera and Prometheus list free, freely available options with varying levels of difficulty and intensity of study. The initial level check can be carried out using the National Ecosystem for Learning and Testing English Language Proficiency for Ukrainians.

The bilingual method of studying geodesic disciplines will serve to gain a certain experience of communication in a foreign language, increase the competitiveness of the graduate and is possible as a result of supplementing existing courses within educational programs with specialized English-language glossaries.

Further professional growth in combination with raising the level of a professional foreign language can be carried out on a number of the following courses specializing in GIS, cartography, and spatial planning.

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***Манютіна О.І., Беспалько Р.І., Гуцул Т.В.***

***АНГЛІЙСЬКА МОВА У ВИЩІЙ ОСВІТІ ГЕОДЕЗИСТІВ ТА ЗЕМЛЕВПОРЯДНИКІВ В УКРАЇНІ: ВИКЛИКИ СЬОГОДЕННЯ***

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***Анотація.*** *Проведено огляд та застосування англійської мови у світі на сучасному етапі. З’ясовано ключове значення англійської мови для міжнародної ділової та наукової комунікації. Розглянуто передумови застосування англійської мови в Україні та її законодавче забезпечення на сучасному етапі. Визначено зміст та обсяг дисципліни «Професійна іноземна мова» в програмі підготовки фахівців за спеціальністю 193 «Геодезія та землеустрій». Проаналізовано цикл «освіта – наука – виробництво» щодо застосування англійської мови за означеною спеціальністю.*

*На етапі освіти обґрунтовується необхідність досягнення рівня В2 як для можливості безбар’єрного здійснення міжнародної академічної мобільності під час навчання, так і для можливості його продовження за наступними освітньо-кваліфікаційними рівнями вищої освіти (магістра, доктора філософії). Науковий етап розкриває термінологічну проблематику та важливість роботи з фаховою спеціалізованою літературою для формування публікаційної активності та інші критерії, пов’язані із знанням іноземної мови, необхідними для здобуття вчених звань. Виробничий момент розглядає англійську мову крізь призму роботи з технічним та технологічним забезпеченням, необхідним для проведення топографо-геодезичних, картографічних та земельно-кадастрових робіт.*

***Ключові слова:*** *англійська мова, геодезія, глобалізація, євроінтеграція, землеустрій, міжнародна академічна мобільність, освіта.*