

**ESP COURSE: FOR STUDENTS OF TECHNICAL UNIVERSITIES**  
**(from the international experience of SibSAU in ELT)**

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The development of innovative economy in Russia forces our society to modernize the system of higher education and reassess ELT. Much attention is paid to space technologies, nanotechnologies, materials study, superconductors and IT, aviation, etc. New developments of these technologies also contributed to the rise of ESP. Thus, 'English for Specific Purposes' is regarded as of paramount importance at the Siberian State Aerospace University. Our students are in the situation where the medium of instruction is the mother tongue but students need to read some specialist texts which are available only in English. The teaching staff of the University realizes the necessity of upgrading the current curriculum, taking into account modern trends and requirements.

ESP is a goal directed discipline, as students are not learning the English language for the sake of it, but because they need to use it. ESP students are learning the language in order to communicate a set of professional skills and to perform particular job-related functions. An ESP program is built on an assessment of purposes and needs and the functions for which English is required. The ESP focal point is that English is not taught as a subject separated from the students' real world (or wishes); instead, it is integrated into a subject matter area important to the learners.

In ESP it is a needs analysis that determines which language skills are most needed by the students, and the syllabus is designed accordingly. In the frame of the Grant "LAPROCOM TEMPUS TACIS" Needs Analysis of junior and senior students was carried out at the Siberian State Aerospace University named after academician M.F. Reshetnev. The data of the analysis shows that students of technical specialties attach great importance to knowledge of the English language. They consider it important for their future careers and are convinced that competence in English will help them to become better professionals in their chosen field. The results of the analysis reveals the importance of the following language skills: reading and translating special literature, understanding lectures presented in English, writing articles in the foreign journals, making a report on international conferences, etc.

Taking into consideration needs analysis, we designed the curriculum of our course. It is a new English course for future engineers looking for new materials with a not only language-oriented approach but also content. It combines subject matter and English language teaching. In the ESP class, students are shown how the subject-matter content is expressed in English. ESP assesses needs and integrates motivation, subject matter and content for the teaching of relevant skills. Diverse professional fields are united, in which English is taught, and provide ESP teachers with the necessary knowledge and instruments to deal with their students' specializations. The professors and the experts of our university provide the authentic content, as the main purpose of teaching is to enable students to deal with authentic information; up-to-date, as the informational exchange is growing more and more intense; and relevant for the students' specializations, as they ought to be given the information representative for their target language use situation.

The ESP course presents and practices vocabulary, fixed expressions, motivates students by stating range of interesting problem. It provides practice and consolidation of the language. In addition, it includes extra materials. We tried to avoid highly specific materials and gave some chance to students' specialism. We looked for topics which gave access to a number of different specialist areas. ESP covers subjects varying from engineering materials and technologies or science to space and aviation. We organized our lessons (1 – 51) into 9 units according to the principal themes: Engineering, Gases, Liquids and solids, Technical

documentation, Effective Technologies in Solving Ecological Problems, Scientific Research, Visiting a Plant (firm), Modern Technologies in Industry and Production, Space. The focus in our curriculum is on the full range of skills (reading, writing, listening, speaking).

According to the job description, an engineer must possess three competencies: technical knowledge, professionalism and management skills. While studying our course students have the opportunity to demonstrate them: meeting an overseas visitor at the plant, the explanation of a business plan of his staying, discussion of innovative processes and methods in modern production, the specific features of working with modern materials. Engineers should know how to organize the process of production, its stages. Taking into account the needs of our country in transforming our economy from raw into innovative one, the creation of national techno parks, national research centers, in which technical universities play a prior role, we included in our course materials about setting up an industrial process. Great attention was paid to the role of a laboratory in a profitable and efficient manufacturing, because nowadays, we can say, there are no boundaries between a laboratory and production.

Topic “*Engineering*” deals with the discussion of modern engineering and trends in this field. Students must find the definition of ‘engineering’ in the text, in different dictionaries, and they are supposed to express their opinion of the role of engineering and science in our life. It is devoted to the job description of an engineer, to smart materials, because nowadays much attention is paid to the creation of new materials in the world of science and technologies. They have already changed the world of engineering. Students read texts about smart materials, their types (piezoelectric, shape memory alloys and shape memory polymers, halochromic, electro-rheostatic and magneto-rheostatic), fulfil a number of lexical exercises, find additional information, make a presentation and they discuss the necessity of such materials in production.

The profession of an engineer requires a profound knowledge in different fields of Physics. We have chosen the most common material in this discipline for all our students – ‘*States of Matter*’ (gases, liquids and solids). This unit contains very useful terms (e. g. tables with chemical elements, the data of their relative molecular mass, melting and boiling points). Students like to analyze properties of solids, liquids and gases, explain changes of state, the gas laws, to solve sums, etc.

Technologies are becoming more sophisticated in their evolution. *Modern Technologies* are always resulted in innovations. This factor means that they can be the source of technogenic catastrophes. The possibility of the catastrophe is not the consequence of the properties of separate parts, but the property of the whole, i.e. a technological system possesses a complicated dynamics. Technologies ‘combine’ a number of operations, productions and processes into one system. The complexity of assembling creates the system, possessing its own behavior, which peculiarities should be taken into account. We emphasize in our course the *Ecologic* and humanitarian determinant as a factor of the development of mechanical and technological sciences (ecological thinking is a principle element of scientific world view, ecological crises, ecological catastrophes, resources of our planet). The central position among high technologies belongs to communicatory machinery, which allows to divide deeply the production process, and then to combine it into an entire net. Such high technologies as IT, biotechnology, micro- and nanotechnologies, *Smart Materials*, energy will influence the future.

In these conditions the problem of reliability of technical objects is very urgent, because of the influence of synergistic effect, which emerges by the interdependence of technological ties. These ties change the structure of the perceived reality by people and the spectrum of their social roles. Students’ position formation is very important, especially in the problematic situation when the combination of the development of mechanics and the environmental protection is very important. That is why the problems of *Safety at Work*, an

integrated *Process Control* in production, automation are discussed in class. Students read the authentic materials (e. g. the Health and Safety at Work Acts; modern standards for batch processing in Europe such as Oracle, SAP, ERP) and share their opinion or even job experience with group mates. For example, they try to prove that significant benefits can be gained from an integrated approach to process automation and factory control, using the information from the text about Rockwell Automation's Integrated Architecture.

Students are acquainted with the general structure and principles of organization of different *Manuals and Documents* of devices, tools, installations in engineering and science. For this purpose we use the operational manuals of Boeing 737: Flight Management and Navigation Systems Description. Students are supposed to work successfully with different manuals dealing with their specialization.

In the frame of our discipline we pay much attention to the integration of the learning process and scientific research in our university. Thus, one unit in the course is devoted to the scientific work of students. For example, the students of the Institute of Space Research and High Technologies (Technical Physics Department) have scientific supervisors and conduct researches in the field of Nanotechnologies, Physics of Thin Films, Satellite Systems, so we give them a good possibility to demonstrate and discuss in group the results of their scientific investigation. Moreover, teachers of some technical disciplines use not only Russian articles but also some works of foreign authors that are written in English. We think that there is a strong necessity of collaboration between the Chair of Foreign Languages and Technical Institutes of the University.

As we are teaching students of the aerospace university, we can't help taking materials in *Space and Aviation* (rocket engines, aerospace machinery, new trends in aviation, space tourism). Students are interested in the information about Rosetta and Voyager Spacecraft, Alternative Jet Fuels, NASA's Fundamental Aeronautics Program and ESA's European Space Operations Centre (ESOC). We hope that this unit will be further elaborated and developed in a separate course and the teachers of our university will write a number of renewal textbooks.

Producing a syllabus, we gave a high priority to the language material that students would meet in the literature and oral communication in their professional area. We identified the language needed by a particular group of students by analyzing the linguistic characteristics of their specialist area of study and work. The identified features formed the syllabus of our ESP course.

We approved our materials: the classes of the pilot course (51 contact hours) were given to a group of students, representatives of different technical specialties). In the process of teaching we saw that the course was very useful because it gives the opportunity to the students to demonstrate their professional skills using the English language and to communicate successfully in different professional situations.

The ESP 2 course is aimed at senior students, post-graduates and students taking a Master's degree of technical specialties. Subjects selected by the developers of the course help students enrich vocabulary, communicative and listening skills in their professional sphere. The course contains texts that are supposed to be read by the students at the lessons and independently. Students will learn vocabulary through reading technical and scientific texts.

The ESP course implies an approach to English language teaching which aims to meet the needs of our technical students taking into consideration the peculiarities of the Aerospace University.

Nowadays the attitude of students to learning is emphasized. The number of hours for independent work increases. Consequently, students' responsibility for their study rises. They

must be more self-organized, mobile, deeply interested and motivated in improving skills and qualification.

In February 2009 we held a pilot course “ESP” for students of technical specialties at the Siberian State Aerospace University. The students who entered the group had a rather high level of English. The duration of the course is 51 contact hours. At the lessons students studied problems, they discussed new achievements of science and technology, such as robotics, space, new technologies in solving ecological problems, nanotechnologies, etc. Finishing every unit, students made their presentations. At present the group of students of technical specialties is studying in Edinburgh, in Heriot-Watt University. We think that the results of the pilot course are wholly satisfactory; the material of the course corresponds to the interests and needs of the students of the Siberian State Aerospace University. However, during the approbation we concluded that the content (not the language) is difficult for junior students. The materials of the course were partially approved at the lessons of post-graduates and students of master programme in our university. We saw that this category of learners manage the tasks more easily even if the level of their English is lower than the level of students. In our opinion, it is worthwhile to teach ESP to the forth-year and fifth-year students, post-graduates and students of master programme of the university.

In our opinion, interesting themes of the curriculum and exercises contribute to the rise of the students’ motivation to the studying English. Designing our course, we have included only authentic texts. The approach to the teaching ESP course in our university is innovative. It means using a new multi-media laboratory that was equipped thanks to the grant TEMPUS TACIS. Having classes in such a laboratory, students become more motivated. The facilities of the multimedia laboratory and the resource centre give us the opportunity to use innovative methods in teaching English for Specific Purposes.

The teachers of our university consider that it is necessary to develop the system of innovative engineering education that implies purposeful forming of definite knowledge, skills, methodological culture and complex integrated training of specialists in the field of engineering. The development of innovative education is possible thanks to appropriate content, methods of training and high educational technologies.

Our purpose was to create an effective comprehensive career development programme that integrates means and outcomes and facilitates the adaptation of knowledge in businesses. The carefully planned programme gives employees the opportunity to take part in the process of mastering English that contributes directly to futural goals and immediate needs. Modern businesses in Russia should maintain a high level of productivity and compete favorably with their partners in other countries. To function successfully in the international educational and economic area modern professionals have to use foreign languages. Therefore English is an essential tool for effective communication in the international scientific and professional arena.

Thus new trends in the development of modern science, technologies and market demand immediate reassessing approaches to the ELT for students of technical specialties. ESP is becoming more and more required for future professionals. Nowadays it is very important to design and further develop ESP courses to meet specified needs of the learners. Great opportunity in this work is given by joint European project, such as Grant “LAPROCOM TEMPUS TACIS”. Colleagues had a good possibility to exchange their teaching experience, to work with rich resources (electronic data base, libraries, students’ language laboratories and their equipment, etc.) of the Universities – partners, in our case, the University of Granada and in Heriot-Watt University in Edinburgh. For the students of technical specialties (Computer Science, Aviation) the study for the whole semester in Heriot-Watt University in Edinburgh was not only a good possibility in their professional training, but also they experienced other culture, the cultural peculiarities in science and in the world

perception. We hope to develop international collaboration in this sphere, because it is very fruitful.