

Impressions of students on the pre-diploma internship

In the period from February, 5 to April, 14 of this year, the students of the graduate course of the bachelor's degree of the department of space technics and technology passed pre-diploma practice at various enterprises of the space industry. Several students of the department have undergone pre-diploma practice in "Ghalam" LLP located on the territory of the National Space Center, which is the first Kazakhstan enterprise where space technology is designed, assembled and tested. In accordance with the themes of the graduation diploma, the students were distributed to the appropriate departments of "Ghalam" LLP. During the practice period, students mastered new types of software, designed the sophisticated space instruments, assessed the effect of the space environment on the satellite modules, and themselves wrote programs for calculations in various programming languages. Some students of the department who passed practice in a special subdivision of "Ghalam" LLP, special design office of space technology, under the supervision of experienced engineers, share their impressions.



The 4th year student of Space technics and technology department Kurmanbek Bayan:

- I passed pre-diploma internship in the design office of LLP "Ghalam", under the supervision of the design engineer Zhumazhanov B.R., who is engaged in the design of optical systems.

Upon arrival at the company, I was instructed on labour safety rules and familiarized with the enterprise. During the pre-diploma practice I was acquainted with all the materials concerning my diploma work, I was helped to learn the basics of the special programs, assigned to design the optical systems, which I actively used for the practical part of my graduations work. The necessary conditions for work were created for me at the enterprise, and the practice supervisor gave me the necessary technical references. When I had any questions, I was given competent, practical responses, not only during the practice period, but also before and after it. I would like to express my gratitude to the staff of "Ghalam" LLP, and personally to the practice supervisor, the design engineer Zhumazhanov B.R. for the experience gained in the period of passing the pre-diploma practice.

The 4th year student of Space technics and technology department Lashuk Maxim:

- I passed pre-diploma practice from February 5 to April 14, 2018 in LLP "Ghalam". The pre-diploma practice was passed in the 3D-printing section of the metal working shop of the special design office of space technology. On arrival at the site, I was instructed on safety rules during the work on the 3D-printing site. During the period of practice, I got acquainted with the technical documentation on the operation and maintenance of equipment on the site. I have mastered the work on preparation of equipment for printing, management and monitoring of 3D printing, removal and processing of printed parts. I have performed additional refinement of details of space application. The site has all the necessary equipment for carrying out the technological process of 3D printing. The 3D printer located on the site works on selective laser melting technology and produces three-dimensional metal parts. The main materials are steel, titanium and aluminum powders. This process can reduce the financial costs of manufacturing and save time devoted to the production of parts. I would like to thank Galam LLP for the opportunity to undergo pre-diploma practice at the enterprise and to obtain practical skills of working on a 3D printer and theoretical knowledge necessary for writing my graduation work. Separately I express my gratitude to the technologists and operators of the metalworking

department, as well I address special thanks to the practice supervisor from the enterprise, engineer-technologist Kapkenov Daniyar Sakenovich.

The 4th year student of Space technics and technology department Usenov Asan:



- I passed a pre-diploma internship at the design office of Ghalam company. The theme of the diploma work is "Methods for detecting ghost rays in the optical system of ERS satellites" and design of optical systems is one of work directions of the design office.

During the practice, a comprehensive overview of the topic of the diploma work, as well as the maximal support was provided in learning the bases of Zemax software. The company provided the necessary conditions for work, and I was provided with additional technical references. At the same time, my

supervisor was answering all questions, arisen during the diploma work, and gave valuable recommendations for diploma work.

As a result of the pre-diploma internship, I collected practical and theoretical information on the development of optical systems and I developed the practical part of the diploma work.

I would like to express my thanks to Ghalam staff and my supervisor Zhumazhanov Berik for the knowledge and experience I obtained during the internship.

The 4th year student of the department of space technics and technology Gorobets Arthur:

- I'm going to graduate from the Department of Space Technics and Technology at the Eurasian National University named after Gumilev. I passed my pre-diploma practice in the design bureau of LLP "Galam" under the supervision of design engineers Zhumazhanov Berik Rahimbekovich and Yessengaliev Arman Gibatovich. Berik Rahimbekovich deals with the design of optical systems. He was engaged in creating a technological payload for the domestic remote sensing satellite. Arman Gibatovich is engaged in the development of software for planning the satellite flight mission and ballistic-navigational software of satellite flight.

As soon as I arrived at Ghalam, I was instructed on safety rules and also got acquainted with the work of the enterprise. Ghalam deals with all the stages of space technics development - from designing them in the design bureau to manufacturing on technological workshops. The enterprise is equipped with the most modern and advanced equipment. I was given a workplace, and all the conditions for productive work were provided. Berik Rahimbekovich provided all the necessary technical literature for the theoretical part. Invaluable support in programming was given to me by a talented programmer, engineer-designer Yessengaliev Arman. My supervisors answered all the questions of interest, not only during the practice, but also after its completion and even before its beginning. I express my gratitude to all the friendly staff of LLP "Galam", especially to my supervisors, Berik Rahimbekovich and Arman Gibatovich. I have acquired an invaluable experience, which will certainly be useful for me in the future.