MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SUMY NATIONAL AGRARIAN UNIVERSITY

APPROVED

Doctor of Agricultural Sciences,
Professor, Academician of the National
Academy of Agrarian Sciences of
Ukraine_____ V.I. Ladyka

"_____" _____ 2017

Evaluation Report of the Study Programme

HIGHER EDUCATION LEVEL – Second (Master's) level
(name of higher education level)
STUDY OF HIGHER EDUCATION – Master
(the title of higher education)
SECTORALSCIENCE – 20 «Agricultural Sciences and Food»
(code and industry name)
SPECIALTY – 208 Agroengineering
(code and specialty name)

Sumy, 2018

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Introduction

Sumy National Agrarian University is one of the leading agrarian educational institutions in Ukraine for training personnel for the agro-industrial complex, whose specialty is accredited by the Ministry of Education and Science of Ukraine and the European accreditation agencyACQUIN. The University cooperates with almost two dozen of research institutes of the National Academy of Agrarian Sciences and the National Academy of Sciences of Ukraine.

Sumy National Agrarian University was founded inApril1977 as a branch of Kharkiv Agricultural Institute named after V.V. Dokuchaev. In 1990, the branch was reformed into the institute. Sumy State Agrarian University was founded in accordance with the Resolution of the Cabinet of Ministers of Ukraine in July 15, 1997 № 744. By the Decree of the President of Ukraine in August 7, 2001 No. 591/2001 Sumy State Agrarian University was granted the status of the National University.Bythe decision oftheStateCertifyingCommission of November 27, 2007, Record No. 68, the universitywas accredited to the IV (fourth) highest level in Ukraine and issued a certificate RD – IVNo.193846ofDecember 11, 2007.Since 2005, the University is headed by Ladka Volodymyr Ivanovich (Doctor of Agricultural Sciences, Professor, Academician of the National Academy of Agrarian Sciences of Ukraine).

Location of the University: 160 Herasym Kondratiev, Sumy, 40021, Ukraine, tel.: (0542) 78-74-76, fax: (0542) 78-74-78, sau.sumy.ua@gmail.com;web site: www.sau.sumy.ua.

SNAU is located in the complex "SNAU University Campus" which houses some modern educational buildings, a landscape park, the dormitories, etc.Moreover there is a refreshment at the University and the canteen. There is an assembly hall and a students' club, a sports complex for cultural and sports activities. There is also a medical centre.

Sumy National Agrarian University conducts training in 22 specialties for III, IV levels of accreditation.

The University trains highly qualified specialists for the agrarian sector and other sectors of the country's economy with profound learning of foreign languages and modern information technologies under such accredited engineering educational programs ("bachelor" and "master").

All specialties are organizationally united in 8 departments, Institute of Post Diploma Education and Consulting, the department of pre-university training, vocational guidance and marketing. The teaching and research processes are provided by 50 chairs, with 51 Doctors of Sciences and Professors, 268 Candidates of Sciences and 190 Associate Professors (up to 01.10.2017).

The staff members are: Academician of the National Academy of Science of Ukraine, Academician of the Academy of Economic Sciences, Academician of the Transport Academy of Civil Engineering, Academician of the New York Academy of Sciences, 4 Corresponding Members of the ANU inEngineering, 3 Honored Workers of National Education, 2 Honored Veterinary Medicine Workers, 2 Honored Workers of Science and Technology of Ukraine, 5 Excellent of Education in Ukraine, Honored Builder of Ukraine, Honored Worker of Agriculture of Ukraine, State Prize Laureate, other highly skilled teachers. Sumy NAU is the coordinator of scientific research in the region on the problems of the country agricultural sector development.

The strategic direction of the development of economic education at the university is the internationalization of the educational process: the teaching of disciplines is carried out in 4 languages (Ukrainian, Russian, English and German).

Annually Sumy NAU conducts scientific research on orders of the Ministry of Education and Science of Ukraine and international grants. The university has formed some scientific schools in various spheres of scientific research. The University publishes the scientific journal "Visnyk SNAU" (series "Economics and Management", "Agronomics and Biology", "Livestock", "Mechanization and Automation of Production Processes", "Veterinary Medicine") with the international index of scientific citation Index Copernicus and RISC.

The priority direction at Sumy National Agrarian University is the study and introduction of the advanced experience of the best universities in the USA and Europe, teachers' training

programmes, and students' practical training in these universities. Meaningful and effective relationships have been developed with the educational institutions of the Czech Republic, Germany, England, Ireland, Denmark, France, Poland, the Netherlands, Austria, the USA and other countries. International cooperation in joint projects allows students and teachers to improve the language and professional level in a high-tech production environment and to share the acquired experience in Ukraine. Austria, in conjunction with the Vienna School of Higher Education, successfully runs the Master's Degree course in Agrarian Management, the training of which is carried out in accordance with internationally recognized plans and programs, and provides the opportunity to receive a Master's Degree in Germany at the same time as Master of Business Administration (training in Ukrainian and German). Collaboration with universities in US states such as Minnesota, Ohio, Wisconsin, California allows students to undergo a half-year or annual practice in farm and other agrobusiness entities. International cooperation in joint projects allows students and teachers to improve their linguistic and professional level in a high-tech agrarian industry and to disseminate their experience in Ukraine. SNAU students are practicing in European and US farms.

Students of SNAU have practise on European and the US farms. International activities are carried out through contacts with international funds, the involvement of foreign specialists in the teaching of chosen special courses for students and participation in short-term workshops (cycle events) for business organizations and consumer cooperatives, cooperation with higher educational institutions abroad, exchange of scientific and pedagogical workers.

Various forms of integration with the higher educational institutions of the I-II accreditation levels and the lyceums of the region are being developed. Their best alumni get the right to continue their studies in a short term at Sumy National Agrarian University.

The material and technical equipment of the specialized training rooms and laboratories of the SNAU is up-to-date, satisfies the requirements and allows to fully ensure the implementation of educational programs in the disciplines.

The material and technical base of the university consists of 8 teaching and laboratory premises and with a modern assembly hall for 700 seats. The population of students at the University is located in 4 hostels for 2,167 places.

The university operates the principle of continuous computerization: today in the university there are more than 980 computer places and the number of contact display time for each student, depending on the specialty, ranges from 250 to 350 hours.

Students and teachers have the opportunity to learn information about the latest achievements of science through the internet. The university has a local computer network. For the organization of the general computer network SNAU used 10 servers.The library of Sumy NAU has more than 500 thousand copies. The structure includes scientific, educational, artistic and reference information editions, electronic textbooks of distance learning forms with access to the internet.The training in the MOODLE system as a form of curriculum is being actively carried out.There are official accesses to the most popular scientific and metric databases Scopus and Web of Science at the faculty, they allow to get the necessary information in full access.

The University's website is participating in the international Webometrics ranking and ranked 72 out of 295 possible and ranked 26th among 101 in the national ranking as a result of monitoring the openness of websites of higher educational institutions of Ukraine.

The research work is concentrated in 19laboratories and post-graduate studies work in 20 specialties including engineering ones: 133 Industry mechanical engineering.

Together with the Bila Tserkva NAU Sumy National Agrarian University won the European Union Erasmus + CA1 "International Credit Mobility" project. The participation in the program contributes to the improvement of the quality of professional education and the level of knowledge of the English language in order to strengthen scientific and academic cooperation, modernization of educational materials, tools and methods, activation of scientific research.

SNAU is a member of: the International Professional Association for Agricultural Management and Rural Development, the World Scientific Organization for Poultry Production (WPSA-World Poultry Science Association), the World Veterinarians Organization (World

Veterinarian Association), the European Association of Agricultural Faculties (ESAF- European Society of Agricultural Faculties), the associations of deans of economic specialties European Universities (Ukrainian-Polish-Slovak Forum), Universities Association under the V4, Network of Natural Sciences Universities of Central and Eastern Europe (CASEE).

The University maintains close contacts with about 200 enterprises of different industry orientation and territorial location. Cooperation gives the positive results both in the sphere of internship placement and further placement of students, as well as in obtaining reliable information for conducting thorough scientific research in all spheres of scientific interests of the SNAU.

The high level of educational material base, the professionalism of the department, national and international recognition of the activity results of a significant contribution to the development of national education and science give the right to consider Sumy National Agrarian University as a full-fledged educational, scientific and cultural centre.

The Engineering and Technology Department provides educational process in specialties:

- 6.100102 "Processes, machines and equipment of agro-industrial production", - educational qualification level is "Bachelor", a course of training - 4 years (on the basis of general secondary education).

- 208 "Agroengineering" - an educational qualification level is "Bachelor", a course of training - 4 years (on the basis of general secondary education).

- 208 "Agroengineering" - an educational qualification level is "Bachelor", a course of training - 2 years (based on the qualification of a junior specialist).

- 275.03 "Transport technologies (motor transport)" - an educational qualification level is “Bachelor” a course of training - 4 years (on the basis of general secondary education).

- 275.03 "Transport technologies (motor transport)" -an educational qualification level is "Bachelor", a course of training - 2 years (on the basis of an educational qualification of a junior specialist).

- 6.100101 "Power engineering and electrical engineering systems in the agro-industrial complex" - an educational qualification level is "Bachelor", a course of training - 4 years (on the basis of general secondary education).

- 6.100101 "Power engineering and electrotechnical systems in agro-industrial complex" - an educational qualification level is "Bachelor", a course of training - 2 years (on the basis of educational level of a junior specialist).

- 141 "Electric power, electrical engineering and electromechanics" - an educational qualification level is "Bachelor", a course of training - 4 years (on the basis of general secondary education).

- 141 "Electric power, electrical engineering and electromechanics" - an educational qualification level is "Bachelor", a course of training - 2 years (on the basis of educational level of a junior specialist).

- 208 "Agroengineering", educational and professional program "Mechanization of Agriculture" - educational degree "Master", a course of training - 1 year 4 months (on the basis of basic and complete higher education).

- 208 "Agroengineering", educational and professional program "Technologies and quality of transportation" - educational degree "Master", a course of training - 1 year 4 months (on the basis of basic and complete higher education).

- 141 "Electric power, electrical engineering and electromechanics" - educational degree "Master", a course of training - 1 year 4 months (on the basis of basic and complete higher education).

Providing of educational process at the Engineering and Technology Department.

The educational process at the faculty is provided by 8 chairs, 5 of which are graduating students.

Highly qualified specialists with a sufficient experience of both scientific and pedagogical activity work at the faculty.2 departments are headed by professors.

The level of scientific and pedagogical staff is high, they provide the educational process for students of specialties.The total number of teachers of the faculty providing the educational process is 70, including 8.6% of doctors, professors. More than 30% of teachers can speak English.

The chairs provide training of scientific and pedagogical staff through doctoral, postgraduate studies and applicants, the continuing improvement of the skills of scientific and pedagogical workers and in accordance with the schedules, they take internship and advanced training in various forms at universities, research institutes etc.

The Engineering and TechnologyDepartment has a separate educational building with a total area of about 12095,5 5 sq.m, in a 4-storied building where 8 chairs are located. The Department has 3 lecture rooms for 120 places each, the rest of the area is distributed in accordance with the needs of each chair and disciplines that are taught at the chairs of other departments. In addition, there is a training parkand a Precision Farming Centre «Horsch-SNAU». The Centre consists of 2 scientific and practical laboratories with active models of equipment, simulators and software, and 4 hectares of field for practical preparation and for reinforcement of learning material.

The level of educational process is quite high. Each training laboratory is provided with the special equipment, instruments and tools, such as: Center of remote education for Moodle studying process, Center of precision farming, Practical educational Complex, John Deere, Class, Case, Horsch laboratories etc.The project of winter educational module with soil heating system for the control of quality of technical operations and machine settings is going to be realized till summer of 2019. Besides, Claas and Elvorti laboratories are being developed. Continuous renewal of existing laboratories with modern units of agricultural machines and control systems is also taking place. The working conditions for the teachers, the teaching subsidiary staff, the conditions for students' training meet the requirements for higher education institutions. The workplaces are equipped with modern furniture, computers and everything needed for productive work.

There are 3 computer classes at the department, which are used by students for learning computer technologies in engineering. Computers have state-of-the-art software that is currently used in production. In general, the estimated number of computerized training seats at the Department per 100 students is 12.2.

The faculty has its own website, which contains information on educational programs, educational, scientific, educational activities, structural units, rules of admission, international cooperation, practice and employment, contacts of the faculty.

The module-rating system was introduced into the educational process.

Students use the library and the reading rooms at the department and the university. The widely – spread systems are:Web of Science, Scopus, Web of Knowledge, Mathematics, Chemical Abstracts, Scimago Journa&Country Rank (SJR).They are equipped with educational and methodological literature. The practical training is carried out on the basis of state institutions, private enterprise, on basic farms of various forms of ownership in various regions of Ukraine. In general, the material and technical base of the department provides a modern level of training and educational process. The department has its own specialized journal "Visnyk", which is published 2 times a year.

Sumy NAU takes the second place in the rating among higher educational institutions of Ukraine in agrarian sphere (http://agravery.com/uk/posts/show/rejting-agrarnih-vnz-ukraini).

Despite the fact that the educational process is provided with the necessary equipment in sufficient quantity (technical means of training, special equipment, etc.), which is refilled and renovated each year according to the needs, the university governing body is planning to further improve and strengthen the resource potential for the university education process.

1. Objectives of programme evaluation report

The **main purpose of the report** on self-examination is an assessment of the possibility of establishing cooperation between the Czech University Life Science other foreign partners and the Sumy National Agrarian University in the field of training specialists for the above-mentioned

specialty subject to compliance:

• the content of the Master's program of the development strategy of the university and the faculty, concerning;

• qualitative composition of teachers for the requirements for scientific and methodological support of the faculty's educational process;

• systems of preparation and control of students' knowledge of international standards of higher education;

• the quality of training graduates to standards of education and labour market requirements (including practical training and readiness to perform professional functions);

• the material base of the university and the faculty for the requirements of the educational process regarding the implementation of the curricula of the respective courses.

And also the openness and accessibility of any information about courses in the educational program, in particular, data on the structure of courses, logic of construction, curriculum and partners.

System of education quality at university.

The educational process of Sumy National Agrarian University is a structured system of organizational and didactic measures aimed at the implementation of the education content at the certain educational level to the requirements according to European higher educational area and state standards.

The educational process is based on the principles of science, humanism, democracy, continuity and the degree of education.It focuses on the formation of an educated, harmoniously developed personality, capable of continuous knowledge updating, professional mobility and accelerated adaptation under conditions of the transitivity of the economy.

The concept of educational activities of Sumy National Agrarian University is determined by its status as a national higher educational institution of agrarian profile whose main goal is further integration into the world educational system and establishment in the status of international.

The Educational and professional Master's programmes of has been developed in accordance with the Law of Ukraine On Higher Education, Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) – http://ihed.org.ua/images/pdf/standards-and-guidelines_for_qa_in_the_ehea_2015.pdf.),International Standard Classification of Education 2011 (ISCED (ISCED) 2011 - http://www.uis.unesco.org/education/documents/isced-2011-en.pdf),International Standard Classification of Education 2013 (ISCED (ISCED) 2013 - http://www.uis.unesco.org/Education/Documents/isced-fields-of-education-training-2013.pdf), Methodical recommendations for the development of higher education standards approved by the Scientific and Methodical Council of the Ministry of Education and Science of Ukraine of March 29, 2016, No. 3.

Description of the internal quality assurance system of educational activities Sumy National Agrarian University is guided by the requirements of Articles 10, 16, 32 of the Law of Ukraine "On Higher Education"dated 01.07.2014 №1556-YII and "European Standards and Guidelines for Quality Assurance in the European Higher Education Area" in Sumy National Agrarian University (further - the University), according to the decision of Academic Council (No. 11 dated April 29, 2016) and the order of the rector.

The University was founded from No. 174-K in April 29, 2016, the sector was created methodological provision for quality management of educational activity and quality higher education.The main tasks of the sector:

I.Maintenance of the quality assurance system for educational activities and Quality of Higher Education (Internal Quality Assurance System):

- definition of principles and procedures for ensuring the quality of higher education;
- monitoring and periodic review of educational programs;
- annual assessment of applicants for higher education, scientific and pedagogical staff of the higher educational institution and regular publicizing the results of such evaluations on the official

website of the higher educational institution, on information stands and in any other way;

- provision of advanced training in pedagogical, scientific and scientific and pedagogical workers;
- ensuring the availability of the necessary resources for the organization of educational process, including independent work of students, for each educational institution the program;
- ensuring the availability of information systems for effective management of educational process;
- ensuring publicity of information about educational programs, degrees of higher education and qualifications;
- providing an effective prevention and detection system academic plagiarism in the scientific works of the university staff and applicants for higher education;
- other procedures and measures for the provision of educational quality activities and quality of higher education.

II.Accompanying the methodological support of the educational process:

- educational and methodical consulting of scientific and pedagogical university staff;
- organization of continuous improvement of scientific and pedagogical staff professional education and qualifications;
- assessment of the quality and effectiveness of teaching and methodological work of scientific and pedagogical workers according to state educational and educational qualification standards;
- organization of researches in the field of development and the technology implementation of teaching and education, improvement forms and methods of work with scientific and pedagogical staff of the university;
- identification, testing and implementation in practice perspective scientific-pedagogical experience, educational and methodical literature, educational technologies and science achievements;
- an effective system organization of methodological work aimed on the development of creative personality of scientific and pedagogical workers;
- educational and methodological counselling and coordination the activities of departments, chairs;
- conducting of informative and reference work, support of the base scientific and pedagogical information, etc.;
- organization of development, approbation and distribution of educational methodological materials;
- information support on organization, conduction and improvement of the educational process;
- methodical support of the creation of educational and methodical complexes for new disciplines;
- concentration, systematization of literature on questions of teaching and methodological work, keeping it in the register and giving teachers for use;
- organization and holding of scientific and methodological conferences on improvement of teaching and methodical work;
- regulation development of the organization and conduction of teaching methodological work in accordance with the standard provisions of the relevant ministries;

Organize contests for:

- the best lecturer of the university;
- the best teaching-methodical complex of discipline;
- the best statement of work on the computerization of the educational process;
- the assistance to teachers in the preparation of educational methodological literature;
- the preparation of scientific and methodological issues to be approved at the meetings Methodological Council of the University;
- the maintenance of computer databases of methodical support of educational disciplines.

In accordance with European Standards using European Credit Transfer System, taking into account the National Qualification Framework, requirements of current legislation and learning outcomes A set of measures, criteria and procedures for their evaluation has been developed according to improvement of the existing quality system of higher education.In developing measures to improve the existing system The management of education quality provided several stages, namely:

• to determine the directions and responsibilities required for achievement of goals in the field of quality of education;

• to establish the methods that measure performance and the effectiveness of each direction;

• to identify of factors influencing the outcome and ways of elimination unsatisfactory indicators;

• to use of measurement results (indicators) to determine the effectiveness and efficiency of a particular element of the system.

Quality assurance indicators

The quality of education at the University has applied such approaches in assessing qualitative indicators: reputation (based on expert assessments), effectiveness (by objective indicators) and overall.

The key points of such a system include:

1. Quality of educational programs.
2. Level of applicant preparation.
3. The quality of the learning process.
4. Qualification of scientific and pedagogical staff.
5. Information and methodological support of the educational process.
6. Level of educational process equipment.
7. Level of research conducted at the university.
8. Participation in national and international rating surveys.
9. Level of graduates training (including practical training and readiness to perform professional functions) and their demand on the work market

10 Level of activity information publicity the university.

11. The level of effectiveness of the prevention system and detection of academic plagiarism.

The quality management system at the university is provided with monitoring of the main indicators of quality and on the basis of them are developed the Recommendations for the improvement of all preparation components of the higher education applicants.

The central link in the management and quality assurance system is educational process.Control over the applicant quality assurance system for higher education involves identifying the educational process weaknesses, by self-assessment of the educational institution activity, which is carried out systematically according to the criteria defined by the standards of higher education, and the approved schedule of activities.

To ensure the quality of the higher education graduate training in University requirements for applicants, students, teachers and criteria for assessing their compliance with these requirements. Regarding the level of applicant preparation, then the appropriate requirements for schools, lyceums, colleges are put forward.

As regards the students' educational process, requirements are put forward to everyone Chairs that provide this process, including the cycles of general and vocational training. At the same time for the quality of applicant preparation for higher education correspond to the graduation departments.In order to analyse the quality of training specialists in the disciplines of the general and vocational training cycle at the University introduced a system semester rector's control over the quality of applicant training for higher education in all specialties (specializations).In parallel, the rating system of job evaluation was introduced to scientific and pedagogical employees of the University units, whose results are taken into account when conducting a competitive selection for substitution of positions, as well as in determining the best for material incentives.

Other components of the system evaluation are regular surveys (questionnaires) of students,

graduates and their potential clients; introduction credit transfer system of educational organization process, etc.

Thus, during the year complex monitoring is carried out the quality of education at the university level, which takes into account the quality of education process, and provides an assessment of the activity quality of scientific and pedagogical workers. Assessment of the information level, methodological and logistical provision of the educational process are determined in accordance with the regulatory requirements determined by the License conditions.Results of monitoring researches and suggestions concerning improving the quality of education is discussed at academic councils of departments and analytical reports are given at the Academic Council of the University.

Subtitle Indicators of IT-technical equipment

The university has a powerful server hub that is satisfying all needs of educational, scientific, administrative and financial activity. All computers have access to the central server and access to the Internet.In the academic building and the hostel there is a wireless connection to the Wi-Fi network of the Internet. Students can access the Internet from computers in classrooms and from the library's general reading room.

Today, the university has 800 computers (315 of them are used for the educational process). Completed 20 computer classes with access to the Internet resources. In the past the University acquired 20 computers, 10 multimedia projectors and 2 interactive boards for use in the educational process.Acquired technique is installed at the departments of the university, distributed for needs in the educational process of the university.

Subtitle Indicators of publicity

An important role for vocational guidance, educational and methodical work assigned to the University website. The site of a educational institution - a powerful tool for vocational guidance, training, partner search, communication.Its support is not a tribute to fashion, but an ingredient university image.This work is not a part of the department and chair activities only in terms of simple information, but also as a system of management in educational work.

This year the changes have taken place: changed form of the site and created English-language and Russian-language versions. A modern full-fledged portal appearedwithsimple website-business cards. Every department, each chair, student council have their place on the university site portal, Facebook and Instagram pages.

The University website participates in the international ranking of Webometrics and ranks 72 out of 295 possible and 26th among the 101 in the national ranking as a result of monitoring the openness of websites of higher educational institutions of Ukraine. In the World Universities Web Ranking 2015 the University takes the 86th place with 146 popularity on the Internet.

The Internet is the presence of the university and, accordingly, its Internet - rating is not a direct quality indication of the training or scientific capacity, but the university's participation in national and international monitoring and it shows the degree of inclusion in the global information field, authority and resonance of the institution activity, its potential in aspect the involvement of talented students and teachers, the popularity among employers, which are important aspects of effective work.

Purposes of the evaluation report:

- assessment of the quality compliance and preparation level of graduates to the requirements of international professional standards and demands of the specialist labour market,
- identification of the directions and tools for improving the implementation of the curriculum, taking into account the best Ukrainian and foreign educational practices,
- formation of the quality management education system at the level of the educational program in accordance with modern standards and best world practices,
- development of a quality culture in administrative and professors' staff,
- formation of the curriculum external quality assurances in the form of international accreditation of the program,

- development of international academic mobility,
- inclusion of international curriculum rankings.

The Evaluation Report of the Study Programme is prepared by a working group consisting of:

Dovzhyk M.J	PhD, Associate Professor, Dean of the Engineering and Technology Departmentof Sumy National Agrarian University;
Zubko V.M.	PhD, Associate Professor, Head of the Department "Tractors, agricultural machines and transport technologies";
Zakharova T.M.	Ph.D., Associate Professor of Design of Technical Systems Department;
Khvorost T.V.	Ph.D., Associate Professor of Occupational Safety and Physics Department.

This report can be used to obtain a certificate of recognition of the quality of educational process by higher educational institutions of EU countries – participants of international cooperation programs of Sumy National Agrarian University.

2. Coordinating department

The Coordinating Department at Sumy National Agrarian University is the educational department subordinate to the Vice Rector for scientific and educational work that includes the methodical department managing the quality of educational activity and the quality of higher education. The detailed information is available on a website:http://www.sau.sumy.ua/images/nayka/navch-metod-rob/2017/opys_yakosti_osvity.pdf

The coordinating department of the Engineering and Technology Faculty of Sumy National Agrarian University provides the development, implementation and functioning of the system of quality assurance in engineering specialties.

The authority of the scientific and pedagogical staff of the faculty is confirmed by national recognition. The long-term work of the staff of the Engineering and Technology Department was aimed at creating an innovative centre of agrarian technologies. In 2017, the laboratory of precision farming for theoretical and practical training and training ground was presented to students, representatives of agrarian business, public authorities. In February 2018the Prime Minister of Ukraine visited SNAU and commissioned the Ministry of Education and Science of Ukraine and the Ministry of Agrarian Policy and Food of Ukraine to study the experience of establishing and functioning of the centre in order to introduce the experience of SNAU in other educational institutions of Ukraine.

In 2011, on the basis of the Faculty of Engineering and Technology, they opened a laboratory for the restoration of the worked surfaces of mechanisms that rub together and strengthen working surfaces. In this direction, the faculty collaborates with the Silesian Polytechnic University, Gliwice, Poland; Polytechnic in Swietokrzyskie in Kielce, Poland; Institute of Applied Physics of the Academy of Sciences of Moldova.

A centre for testing agricultural machinery in the field was also created. Machines undergo tests in the field with the definition of the properties of materials and working conditions at different modes, it allows you to analyse the change of technical and operational indicators, performance of indicators of technological work and explore the conditions of operation of the operator in terms of comfort and safety. This direction is interesting for companies producing agricultural machinery (Lozovsky forging and mechanical plant, Elvorti plant, Kharkiv tractor plant) and dealers of different brands (ATI, Jupiter 9 Agroservice, Ukrfarming).

The work of scientific schools and educational and scientific laboratories allows you to conduct modern researches that are interesting to the production. These are conditions where student's science moves ahead. Students are involved in all types of work. A student has the right to choose: to write a thesis or to take a complex state examination. The system work in scientific groups allows us to create conditions for student research and to prepare real diploma projects which can be used in the production.

For the last five years all teachers have improved their qualifications having training in other

educational institutions (including abroad) and have got advanced training at various agribusiness enterprises.

The system of advanced training, which is carried out at the chairs, ensures the development of teachers' scientific and pedagogical qualification and meets the modern requirements.

The research work of chairs is aimed at qualitative training of specialists in the specialty 133 – Branch Engineering. Currently, the department prepares candidates according to the speciality 133 – Branch Engineering. In 2017, four post-graduate students, who were taking post-graduate course in the field of "Branch Engineering", entered the faculty. Thus, the total number of postgraduate students at the Faculty of Engineering and Technology is 17. For the last five years, professors of the department successfully defended two doctoral dissertations and two candidate's theses.

Teachers of departments take an active part in international, national conferences, seminars, round tables, have professional relations with scientific communities of national and foreign universities, publish their scientific works in well-known home and foreign publications. In general, the international activity of the chairs includes: cooperation with foreign universities, strengthening of international relations with universities of foreign partners; participation in international scientific events (conferences, seminars, summer schools, educational and scientific exchanges) and participation in international projects.

Authors of the studyprogram:

Dovzhyk M.J.	PhD of Technical Sciences, Associate Professor, Dean of the Engineering and Technology Department of Sumy National Agrarian University;
Zubko V.M.	PhD of Technical Sciences, Associate Head of the Chair of Tractors, agricultural machines and transport technologies;
Tarelnyk V.B.	Doctor of Technical Sciences, Professor, Head of the Chair of Service Department;
Sarzhanov A.A.	PhD of Technical Sciences, Associate Professor, Head of the Chair of operating equipment;
Rozumenko A.M.	PhD in Physics and MathematicsSciences, Associate Professor, Head of the Chair of Higher Mathematics;
Semirnenko Y.I.	PhD of Technical Sciences, Associate Professor, Head of the Chair of Design of Technical Systems;
YakovlevV.F.	PhD of Technical Sciences, Professor, Head of the Chair of Electrical Systems in Agriculture;
Hursenko S.N.	PhD in Physics and MathematicsSciences, Associate Professor, Head of the Chair of Occupational Safety and Physics;
Chepizhnyy A.V.	Senior lecturer, Head of the Chair of Energy in agriculture.

3. Members of programme quality board.

The quality control of the training of students in the specialty "Engineering" is carried out by:

Zhmaylov V.M.	vice rector for educational work;
Kolodnenko N.V.	the head of the educational department;
Dovgyk M.J.	PhD of Technical Sciences, Associate Professor, Dean of the Engineering and Technology Department;
Kalyuzhny M.S.	Student Rector of Sumy NAU;
Budakova G.J.	Student Dean of the Engineering and TechnologyDepartment;
Grynenko O.A.	Chief Designer of the Ukrainian Design Bureau of Transmissions and Chassis;
Karpenko S.M.	Director of "Khlibodar" LLC.

4. Description of the Study Programme

4.1. Profile of the programme

Higher education level	The second (master's) level
Degree of Higher education	Master
Branch of knowledge	20 “Agricultural Sciences and Food”
Specialty	208 Agroengineering
Restrictions on learning forms level	no
Educational qualification	Master in specialty "Agroengineering"
Qualification in the diploma	Mechanical engineer
Description subject area:	**Object of the study and activity:** research, improvement, implementation and effective use of technologies, machines and ways of mechanization of agricultural production, primary processing, storage and transportation of agricultural products, use, maintenance and repair of agricultural machinery. **Learning objectives**: - research activity; - development of programs and work plans of scientific researches; - collection, processing, analysis and systematization of scientific and technical information of national and foreign experience; - implementation of scientific research into production. **Theoretical content of the subject area:** development of research methods, organization, implementation and analysis of research results; analysis of existing and progressive technologies and technical means of mechanized processes of agro-industrial production. **Methods, techniques and technologies:** the applicant of higher education must have professional knowledge, be able to make scientific reports, literature reviews and scientific publications based on the results of research on machinery and technology of agro-industrial production; be able to use the obtained results in the production activity. **Instruments and equipment** (objects / subjects, devices and devices that a learner learns to apply and use): modern scientific approaches to technological processes of agro-industrial production using elements of resource safety and ecological safety.
Academic Rights	Employment in a specialty and / or continuing education for getting the third (educational-scientific) level
Employment of graduates	Research, teaching and administrative activities in the field of agrarian education, science and production, consulting and advisory activities in the field of production.

Volume of ECTS credits needed for a higher education master's degree:

On the basis of complete secondary education - 300-360 ECTS credits. 50% of the volume of the educational program should be aimed at providing general and special (professional) competencies in the specialty defined by the standard of a higher education. The volume of educational programs for obtaining a master's degree on the basis of a junior specialist degree is determined by the higher educational institution.

List of competencies of graduator

Integral competence	Ability to develop and implement the results of scientific research in the field of mechanized agricultural production technologies
Common Competences	1. Readiness for communication in oral and written forms using state language of Ukraine, as well as a foreign language to come to the decision of tasks of professional activity. 2. Readiness to lead a team in the field of personal professional activity with the ability to tolerate social, ethnic, confessional and cultural differences. 3. Ability to understand the essence of modern problems of mechanized technologies of agricultural production, scientific and technical policy within the production of environmentally safe agricultural products. 4. Ability to master the methods for assessing the state of technical support and methods of correction of mechanized technologies of agro-industrial production. 5. Ability to master the methods of designing means of mechanization of technological processes of agro-industrial production. 6. Ability to assess the effectiveness of the use of technical resources and resources in the implementation of mechanized technologies of agricultural production.
Specials (professional, subject matter) competence	1. Ability to use the methodology of scientific research for the creation of new and improved existing agricultural technology systems, the search for optimal methods for their exploitation; ability to perform theoretical researches by methods of classical sciences, using the theory of similarity and analysis of dimensions, statistical dynamics, theory of mass service in the field of mechanization of agriculture. 2. The ability to solve optimization problems for efficient machine use in crop, livestock, storage and transportation of agricultural products. 3. Ability to ensure the efficiency and service ability of agricultural machinery at a minimum cost of time, labour and material resources. 4. Ability to use managerial aspects within the problem of agricultural production. 5. Ability to master the design and working processes of new technical modifications and technological complexes for the production of liquid, solid and gaseous biofuels. 6. Ability to use the principles of environmental safety in the development of new projects and production technologies in the agro-industrial complex; to the analysis of ways to increase the environmental quality of agricultural production. 7. The ability to implement integrated organizational and managerial and technical measures to create safe working conditions for agribusiness workers. 8. Ability to select and calculate heating, water supply and ventilation, buildings; distinguish and choose a sewage system for industrial

	enterprises. 9. Ability to substantiate the basic parameters of agricultural machines; Ability to receive and analyze information on trends in the development of technology and technology in agro-industrial production. 10. Ability to integrate knowledge of mechanics, computer control, information technologies, microelectronics to designing mechatronic systems of machines and equipment of agrarian and industrial complex; the use of mechanical systems with computerized motion control. 11. Ability to use methods and techniques of substantiation and making optimal decisions in engineering activities. 12. Ability to organise production processes of agrarian production on the principles of precision farming systems, resource conservation, optimal use of nature and nature conservation; use agricultural machines and power tools adapted for use in the precision farming system. 13. Ability to use the regulatory and legislative basis for the purpose of legal protection of the objects being developed and their normatively-based introduction into economic circulation, directing the received profit to increase the welfare of the society. 14. The ability to compare critically the basic concepts of the development of the agrarian economy, which is based on modern economic science and the practice of macro regulation at the state level. 15. Ability to use the basic principles of quality management of agro-industrial products based on international approaches; basic methods for determining the competitiveness of technologies and machines in the production of crops. 16. Ability to develop, implement and improve the technical and technological bases of crop production. 17. Ability to develop, implement and improve mechanized technologies in crop production in different forms of ownership and management. 18. Ability to apply knowledge in the field of the diagnostics of machines during their technical exploitation in practice, in particular: to determine the modes of work and to choose the appropriate means for ensuring economic and technological processes; to provide effective technical means of exploitation; carry out the analysis and calculation of the main indicators: suitability, quality, reliability and efficiency of the systems. 19. Ability to determine the energy components of cultivation and harvesting technologies of agricultures: direct energy expenditures, labour costs, energy intensity of technical means and material resources; give an estimation of technological processes according to the criterion of energy indices. 20. The ability to determine the optimal mode of operation of machines in accordance with the specific conditions of their operation and ensure the use of optimal mode. 21. Ability to ensure the implementation of technological requirements by soil, seed and harvesting aggregates. 22. Ability to apply methods of synthesis and analysis and structural reliability of technological systems in the decision of issues of technical diagnostics and forecasting of the capacity of facilities. 23. Ability to apply the theoretical foundations of systems for

	organizing maintenance of machinery in practice, in particular: to determine the technological equipment and modes of its operation, to choose the appropriate means for ensuring economic technological processes. 24.Ability to choose a rational way of mechanical processing of workpieces, equipment, cutting tools, calculate and assign treatment regimes, that is, to choose the rational technology of manufacturing parts. Use methods to control the accuracy of machining parts of machines. 25. Ability to plan the need of machines for their maintenance, determine the need for their resource support; to design rational technological processes of technical service. 26. Ability to design rational technological processes of repairing machines.

The normative content of the training of higher education graduates, formulated in terms of learning outcomes.

Program learning outcomes:

1. Research activities:

- knowledge and understanding of the theory and methodology of system analysis, stages of the implementation of a systematic approach in the study of technological processes, skills to use the methodology of system analysis in the study of mechanized technologies of agro-industrial production;
- development of programs and work plans of scientific researches;
- collection, processing, analysis and systematization of scientific and technical information of native and foreign experience;
- development of methods of conducting experiments, mastering of new research methods, as well as organization, conduction and analysis of the results of experiments;
- creation of optimization models of technical support of mechanized technologies of agro-industrial production;
- preparation of scientific and technical reports, reviews and scientific publications based on the results of researches, their implementation into production.

2. Project-technological activity:

- design of a complex of technical means for providing effective resource-saving mechanized technologies of agro-industrial production;
- development and realization of projects of service maintenance of technical means of enterprises of agro-industrial complex of various forms of ownership;
- development and implementation of a complex of measures for the adaptation of progressive technology and technologies of agro-industrial production according to the conditions of a particular enterprise;
- development and realization of a complex of measures on improvement and increase of energy and resource efficiency of used equipment and technological processes in the conditions of a definite enterprise;
- consultations on innovative mechanized technologies of agro-industrial production.

Forms of certification of applicants who get master's degree

Forms of certificationof applicants who get higher education	The certification is carried out in the form of public defence of the diploma (master's) work
Requirements for diploma work	The subject, author's name and abstract are published on the official website of the institution of higher education or its subdivision**.**
Requirements for the public defence	The defence of the diploma project is carried out at an open meeting of the qualification commission organised on the basis of the order of the head of the educational institution.

Requirements for the system of internal quality assurance in higher education

Functioning in the higher education system of the quality assurance system of educational activity and quality of higher education (internal quality assurance system), which provides the following procedures and measures:

1) definition of principles and procedures for ensuring the quality of higher education according to its specialization;

2) monitoring and periodic review of educational programs;

3) ensuring the qualification of pedagogical, scientific, scientific and pedagogical workers;

4) availability of the necessary resources for the organization of the educational process, including individual work of students, for each educational program according to the specialization;

5) the availability of information systems for the effective management of the educational process;

6) ensuring publicity of information about educational programs, degrees of higher education and qualifications;

Basic disciplines, magistracy programs must be compulsory for students to master, regardless of the profile (specialization) of the program they master. The set of disciplines that relate to the basic part is determined by the higher educational establishment on the basis of the list of competences of the graduate.

Disciplines related to the variational part of the program of magistracy, practice (including research work) are determined by the profile (specialization) of the program. After selecting by the students of the profile (specialization) of the program, a set of relevant disciplines of practice (including research work) are obligatory for applicants of higher education.

Pre-diploma practice is carried out for the graduation thesis (master's degree) and is obligatory.

In developing the Masters programs, the school chooses the types of practices depending on the type of activity that the Masters program focuses on.

Production practice can also be carried out in structural subdivisions of universities.

List of normative documents on which the standard of higher education is based on:

1. Law of Ukraine "On Higher Education" of 01.07.2014 № 1556-VII.

2. Law of Ukraine "On Licensing Types of Economic Activity" dated 02.03.2015 №222-IIII.

3. Resolution of the Cabinet of Ministers of 29.04.2015 № 266 "On approval of the list of branches of knowledge and specialties, which are training applicants for higher education".

4. Resolution of the Cabinet of Ministers dated December 30, 2015 №1187 "On approval of licensing conditions for conducting educational activities of educational institutions".

5. Order of the Ministry of Education and Science of Ukraine dated February 19, 2015 № 166 "Some Issues of Disclosure of Information on the Activities of Higher Educational Institutions".

6. Order of the Ministry of Education and Science of Ukraine dated November 6, 2015

№1151 "On the peculiarities of the introduction of a list of branches of knowledge, under which the training of applicants for higher education, approved by the decision of the Cabinet of Ministers of Ukraine dated April 29, 2015, No. 266".

7. Order of the Ministry of Education of Ukraine № 600 dated 01.06.2016 "On Approval and Introduction of Methodical Recommendations for the Development of Higher Education Standards".

8. Order of the Ministry of Economic Development and Trade of Ukraine dated November 18, 2014, No. 1361 "On Approval of the Amendment to the National Classifier of Ukraine DK 003: 2010" (amendment No. 2).

9. Development of the Quality Assurance System for Higher Education in Ukraine: Information and Analytical Review, National Academy of Pedagogical Sciences of Ukraine, Institute of Higher Education of the National Academy of Sciences of Ukraine, National Erasmus + Office in Ukrainehttp://ihed.org.ua/images/biblioteka/Rozvitok_sisitemi_zabesp_yakosti_VO_UA_2015.pdf.

10. Order of MES № 600.

4.2. Profile of the graduate

The professions, professional titles of works are indicated (according to the current edition of the National Classifier of Ukraine: Classification of Occupations (DK 003: 2010) and International Standard Classification of Occupations 2008 (ISSO-O8)), for which professional education, professional and educational- scientific programs in the specialty:

2310.2 Assistant (a teacher of Higher Educational Establishment);

2145.1Engineer-researcher on mechanization of agriculture;

2145.2 Engineer for diagnosing the technical condition of the machine-tractor park; Engineer of the machine-tractor park; Engineer for mechanization and automation of production processes;

2149.2 Maintenance and repair engineer; Engineer in Labour Protection; Repair engineer;

1312 Director (leader) of a small business (firm).

Employment prospects: Engineer for the operation of the machine-tractor park, engineer mechanic for maintenance and repair of vehicles, engineer for the mechanization of livestock complexes, engineer for technical support of machinery, labour protection engineer, engineer for the mechanization of processing and storage of agricultural products, engineer mechanic.

Graduates of the Faculty of Engineering and Technology work in various branches of the national economy throughout Ukraine and abroad, in particular:

- Deputy Director of the Department of Agro-Industrial Development of the Sumy Regional State Administration;
- Director of Khlibodar LLC http://agroparty.sumy.ua/kerivnictvo-oblasne-2/;
- Director of the service of Jupiter 9 Agroservice Ltd. (distributor of agricultural machinery - John Deere, Manitou, Väderstad);
- Chief Engineer of Vorozhlabatinvest LLC, NCH Capital (Agroprosperis);
- Teachers of the Sumy State University and other educational institutions of Ukraine;
- representatives of the dealer network of agrarian machinery; and service services;
- representatives of service and service enterprises of various types of equipment.

4.3. Study plan

№	Subjects	Form of knowledge assessment	**ECTS**
1. NORMATIVE EDUCATIONAL DISCIPLINES			
1.1.The cycle of disciplines of general preparation			
1.1.1	Pedagogics (Engineering)	credit	3.0
1.1.2	Legislation and Law in Agro-Industrial Complex	credit	3.0
1.1.3	The World Agricultural Production	credit	3.0
1.2The cycle of the disciplines of professional and practical training			
1.2.1	The theory and technology of the scientific researches and the analysis of the technological systems	credit	3.0
1.2.2	The use of the machinery in the agro-industrial complex	exam	8.0
1.2.3	Machinery maintenance	exam	3.0
1.2.4	Engineering Management	exam	3.0
1.2.5	Labour protection in the industry, work environment and civil protection	exam	3.0
II. SELECTIVE EDUCATIONAL DISCIPLINES			
2Disciplines of the individual choice of the educational institution			
2.1.1	Tribotechnology	credit	4.0
2.1.2	Power supply and transportation in agro-industrial complex	credit	4.0
2.1.3	Engineering networks and constructions in agro-industrial complex	exam	3.0
2.1.4	The theory of agricultural machines and advanced technologies in agro-industrial complex	credit	4.0
2.1.5	The theory of tractors and cars and automatic control system for braking and dispersal of wheeled cars	credit	3.0
2.1.6	An estimation of efficiency of engineering decisions	credit	3.0
2.1.7	Geoinformation systems and precision farming system	credit	5.0
2.1.8	Quality management	credit	3.0
2.1.9	Exchange market	credit	3.0
2.1.10	Biofuels: the efficiency of their production and consumption in agro-industrial complex of Ukraine	exam	3.0
2.2 The disciplines of the individual choice of the student			
2.2.1 Master's program "Mechanization of plant growing"			
2.2.1.1	Mechanized technologies in plant growing	exam	3.0
2.2.1.2	Maintenance of machines for plant growing	exam	3.0
2.2.1.3	Machine use in crop production (installation and commissioning)	exam	3.0
2.2.1.4	Design of technological processes in crop production	exam	5.0
2.2.2 Master's program “Technical service”			
2.2.2.1	Technology of maintenance of machines	exam	3.0
2.2.2.2	Organization of work of enterprises of technical support	exam	3.0
2.2.2.3	Technology of repair of cars	exam	3.0
2.2.2.4	Design of technological processes of technical service	exam	5.0

At the end of the course:
Complex exam.

4.4. Learning outcomes of the programme

Matrix of compliance with the Standards of Competencies for NRC descriptors the standard of higher education of Ukraine of the second (master's) level of education, the degree of higher education - the master's degree, the field of knowledge – 20 “Agricultural Sciences and Food” - 208 Agroengineering

Classification of competences	Knowledge	Ability	Communication	Autonomy andresponsibility
Integral competence				
Ability to solve difficult tasks and problems of professional activity in the field of agro-industrial production in the process of training, which involves research and implementation of innovations that are characterized by uncertainty of conditions and requirements.				
Common competences				
1. The ability to critical comparison of the basic concepts of the development of the agrarian economy, which is based on modern economic science and the practice of macro regulation at the state level.	Indicators characterizing the functioning of agricultural production; - basic adoption of macroeconomic analysis; - instruments of state, fiscal-tax regulation and state monetary policy.	To analyse macroeconomic dynamics; - assessment of the dynamics of real GDP, inflation rate and unemployment rate of the agricultural sector of production; - to develop appropriate procedures for technical, technological, organizational and other decisions in accordance with the current principles of national policy.	Interconnection with the statistical support agencies and services of forecasting of possible measures of the economic policy of the government; - interconnection with the forecast supply of changes in the market situation of the agrarian sector of the economy.	Responsibility for the accuracy of the application of basic models and methods of macroeconomic analysis in the process of studying the dynamics of agricultural processes; - autonomy in the analysis of mechanisms and outlooks of the consequences of state regulation of the economy with the help of fiscal, monetary, foreign economic and social policies.
2. Ability of practical knowledge of a foreign language for its use in professional activity; analyse the scientific and technical information and publish the results of scientific research using a foreign language.	Linguistic forms typical for the official registers of professional speech; international and terminological vocabulary.	To conduct dialogue with the expression of certain communicative intentions to find out the opinion of the interlocutor, which is necessary for business negotiations; - to summarize in writing the information and arguments from the relevant sources.	Use of a foreign language in professional activities; presentation of foreign language information of a professional nature.	To be responsible for the content and form of their own statements according to the situation and the recipient, as well as to take into account the level of formalities, depending on the circumstances.

3.Ability to apply legal norms in industrial-economic, economic-entrepreneurial, scientific, agrarian-labour activity.	Theoretical concepts regarding the legal provision of state regulation in the agro-industrial complex; - content of regulatory acts that establish the legal framework for the regulation of agro-industrial complex.	To be aware of the current agrarian legislation; - apply theoretical knowledge and regulations of normative legal acts in practice.	Interconnection with state supervision and control bodies in the field of management, use of nature, land use and other law enforcement agencies.	To be responsible for legality and legitimacy of their actions and decisions
4. To have skills to use knowledge of pedagogy in teaching activities.	The system of higher education in Ukraine and in the world, its main principles, requirements for modern education, basic education documents and Laws; - peculiarities of the content and organization of the pedagogical process in the conditions of different types of educational institutions; - the principles of pedagogical skills, educational technology.	To apply modern innovative technologies in the field of education; to use advanced teaching techniques in engineering disciplines.	To find adequate methods of communicative influence; to act as a catalyst for communication; to prevent and overcome conflict situations.	To beresponsible for the quality of the classes; to enrich our own spiritual culture through self-education.
5.Ability to carry out foreign trade operations in the field of agribusiness.	Normative principles concerning the organization of foreign economic activity in Ukraine for subjects of agrarian business. Essence and content of world agrarian production.	To characterize the factors which influence on the development and transformation of foreign economic activity; -To identify the trends and prospects for the development of specific markets and use these results in their practical activities.	Interconnection with contractors for realization of foreign economic activity on sale and purchase of agricultural products, equipment and technologies.	To be responsible for the effectiveness of foreign trade operations.

6. To have an ability to think creatively and critically, to apply philosophical knowledge in the process of scientific research, and to master the methodology of scientific knowledge, the logic and culture of scientific discussion	To know the philosophical methods of analysis of agrarian processes for solving specific practical problems in the agro-industrial complex.	To be able to operate with philosophical and general-scientific concepts and categories.	To communicate in the middle of the scientific, technical and engineering community on general-methodological and science-related topics.	T be responsible for the accuracy of the conclusions, statements, clarity and reliability of arguments used in the discussion.
Special (professional) competencies				
1. Ability to use managerial aspects within the problem of agricultural production.	Structures and functions of services of engineering management; conditions of effective functioning of technical systems in crop production, animal husbandry, processing, storage, transportation of agricultural products and technical service.	Apply modern methods of motivation, organization, planning and control of the functioning of engineering systems aimed to optimize agricultural production.	Interconnection with representatives of the technical, agronomical and economical services of the economy for the effective functioning of engineering systems by determining the optimal parameters of the structure of the external and internal environment.	To be responsible for the adequacy of substantiation of the technological grounds and the economic efficiency of the organization of the enterprise.
2.The ability to use the methodology of scientific researches to create new ones and to improve the existing techno logical systems of agricultural purpose, search for optimal methods of their exploitation; the ability to perform theoretical researches by methods of	The theory and technology of scientific researches in the field of mechanization of agricultural production; - methods of analysis of the functioning of research objects.	To use modern methods of conducting researches and analysis of their results.	The interaction with research institutes and design and production enterprises of agricultural profile.	To be responsible for reliability of the results of scientific research.

classical sciences with the use of the theory of similarity and analysis of dimensions, statistical dynamics, the theory of mass service in the field of mechanization of agriculture.				
3. Ability to use modern methods of modelling of technological processes and systems for creation of models of mechanized technological processes of agricultural production.	To know the scientific and theoretical principles of modelling of technological processes and systems. To make a choice of special programs, to create algorithms of models of control of mechanisms and automated systems, control over their work and technological operations.	Create a structure and principles for choosing models; creation, planning and conducting of simulation experiments	Interconnection with representatives of leading design, research and production organizations and enterprises.	Responsibility for the adequacy of physical and mathematical models.
4. Ability to solve complex specialized problems and practical problems in the field of agro-industrial production, which provides application of modern information and computer technologies.	Knowledge of the basic principles of modern information technologies according to the specialty; the organization of automated information systems (AIS) in the production on the basis of modern means of technology and appropriate information and software.	Choose and use the appropriate software product for solving engineering problems in the field of agricultural production.	With the help of information networks to connect with a wide range of specialists, institutions and suppliers of the necessary software products.	To work with appropriate automated workplaces both in local regime and with the help of various computer networks.
5.Ability to solve optimization	Modern mechanized	Databases on domestic and	Contact with producers of	Responsibility for effective machine

problems for efficient machine use in planting, animal husbandry, storage and transportation of agricultural products	technologies and machines for the production and storage and transportation of agricultural products; - characteristics of agricultural machinery; - Optimization criteria.	foreign agricultural machinery, - use optimization methods to select rational depots of machine-tractor units and parks.	agricultural machinery, machine research stations and agricultural workers.	use according to selected optimization criteria; -responsibility for the level of professional competence of the engineering service.
6. Ability to integrate knowledge of mechanics, computer control, information technologies, microelectronics to the design of mechatronic systems of machines and equipment of agro-industrial complex; the use of mechanical systems with computerized motion control.	Basic principles of the theory of management of modern hardware and software of computer technology; - promising approaches to the synthesis of controlled motion of mechatronic systems from the conditions of maximum automation of production processes in the agro-industrial complex.	Apply - Integral interaction of mechatronic modules in a single modular system; - progressive methods and techniques for receiving and processing information by the mechatronic system of the environment.	Interconnection with the manufacturers of devices and systems of mechatronics and their service centres, interconnection with representatives of enterprises of information and computer technologies.	To be responsible for the accuracy of the proposed algorithms, mechatronic systems and the reliability of their results.
7. Ability to design technologies and technical means of production of primary processing, storage and transportation of agricultural products	Trends in the development of agricultural production; priority technologies of agricultural production; - the systemic interdependence of the criteria for choosing the technology of agro-food production and the criteria for selecting equipment for technological lines.	To apply methods of multicriteria selection of technologies of agro-food production and equipment of technological lines. To substantiate the specialization and productivity of technological lines taking into account the forecast of changes in the demand for agro-food products.	Interconnection - with representatives of technical and technological services, dealers in the sale of machinery and equipment; - with producers and consumers of agro-food products, agrarian exchanges.	To be responsible for the feasibility of design decisions regarding the technology of work execution, as well as technological lines equipment.

8.Ability to use methods of management and planning of material and related to them information and financial flows on the basis of a system approach and economic compromises for increasing the competitiveness of enterprises.	Strategies and tactics for the operation of procurement, production and transport logistics, as well as distribution, stock and warehousing logistics; - types of transport, loading and unloading equipment and features of its use; - the main approaches to optimizing transport logistics chains support.	To solve problems of functioning of logistic systems - delivery of necessary goods of the required quality in the necessary quantity at the right time and in the necessary place with minimal expenses.	Interconnection of logistics with different functional systems, management, detection, analysis and evaluation of phenomena that correspond to the main stages of the process of movement of material flows from production enterprises to consumers and factors that affect them.	To be responsible for the effectiveness of the full use of the potential of vehicles in specific natural and productive conditions, the definition of the need for these tools in order to achieve programmed results and compliance.
9. Ability to ensure the efficiency and service ability of agricultural machinery at a minimum cost of time, labour and material resources.	The main organizational and technological principles of ensuring the robustness of technology.	To choose rational forms of organization and technology of maintenance and repair of equipment.	Operational relationship with the operators of agricultural machinery, dealerships, service centres, repair companies, representatives of post-office services.	System approach to ensuring the robustness of machines.
10. Ability to organize production processes of agrarian production on the principles of precision farming systems, resource conservation, optimal use of nature and nature conservation; use agricultural machines and power tools adapted for use in the precision farming system	Global Positioning Systems (GPS, GLONASS, Galileo), special sensors, aerial photographs and satellite images, as well as special programs for agronomist management based on geographic information systems; - software-hardware, methodical and technological support for the	To use the basic principles of precision farming for sowing planning, calculation of fertilizer and plant protection measures, more precise prediction of yield and financial planning of production activities in the agro-industrial complex; - use specialized on-board computer hardware and software.	To carry out professional interaction with employees of agrochemical services, engineers and scientists of different parts in order to ensure the effectiveness of using the advantages of the system of field agriculture.	

	use of system agriculture.			
11. Ability to receive and analyse information about trends in agrarian sciences, technologies and machinery in agro-industrial production.	Innovative technologies and means of mechanization in the agro-industrial complex.	To compare, evaluate and choose promising technologies and technical means of agro-industrial production.	Visiting thematic exhibitions, connected with research institutes, educational establishments, manufacturing enterprises, re-gular access to information through the Internet.	Broad erudition on the basis of deep engineering knowledge.
12. Ability to use the basic principles of quality management of agro-industrial products based on international approaches; basic methods for determining the competitiveness of technologies and machines in the production of agricultural crops.	The order of application of standards in the process of creation and certification of the quality management system at the enterprise, conducting internal and external audit of the quality management system, principles of building quality management systems based on ISO 9000 standards, the bases of environmental management systems, principles of designing HACCP food safety management systems.	To identify and analyse the factors of improving the quality of products and ensuring its competitiveness; - to undertake activities on the organization of work on the development and implementation of quality management systems in accordance with the recommendations of the international standards ISO Series 9000.	Interconnection with standardization organizations, certification bodies, testing laboratories, certified auditors.	To be responsible for the results of the implementation and functioning of the quality management system at the enterprise, to control the detection of inappropriate products and to analyse the causes of its occurrence.
13. Ability to use methods and techniques of substantiation and making optimal decisions in	Methodology and tools for analysis, models and criteria for the adoption of engineering	To apply a software-targeted approach to the adoption of engineering science and	Interconnection with representatives of analytical services, engineering and consulting	To be responsible for the correctness of the decision options for the strategy development of

engineering activities.	science and technology solutions.	technology solutions; - to develop models and algorithms for solving technical and technological problems; - to substantiate the strategies of development of technical and technological systems of agrarian production.	companies.	technical and technological systems of agrarian production.
14. Ability to use the regulatory and legislative basis for the purpose of legal protection of the objects being developed and their normatively-based introduction into economic circulation, directing the received profit to increase the welfare of the society.	Fundamentals of Intellectual and Industrial Property System in Invention and Patent-Licensing Activities; -methodological foundations for the creation of industrial property objects; - Fundamentals of Patent Rights Protection	To define the concept, essence and features of the right of intellectual property, its types; Apply: - to use the legal acts, patent documentation in the design of the know-how and materials of the application for the object of industrial property, the drawing up of licenses and other contracts for the creation, use and commercial realization of intellectual property.	Interconnection with representatives of state bodies involved in the registration and protection of intellectual property objects.	Ensure that the intellectual property object is in compliance with current legal acts. Responsibility for infringement of intellectual property rights belonging to other persons.
15. Ability to use the principles of environmental safety in the development of new projects and production technologies in the agro-industrial complex; to the analysis of ways to increase the	Indicators determining the level of environmental safety of technical and technological processes in the agro-industrial complex; - ways to ensure regulatory and legal requirements for	To develop organizational and technical measures to ensure environmental safety when performing technical and technological processes in agro-industrial production.	Interconnection with representatives of state environmental services.	To be responsible for observance of the basic environmental principles and the rational use of natural and technical resources.

environmental quality of agricultural production.	environmental safety in the development and implementation of technical and technological processes in the agro-industrial complex.			
16. The ability of integrated implementation of organizational and managerial and technical measures to create safe working conditions for the workers of the agro-industrial complex.	Peculiarities of working conditions in the implementation of production processes in the agro-industrial complex; - the requirements of documents for the organization of workplaces, production processes, as well as indicators that characterize the working conditions and requirements for safety of work.	Apply the requirements of labour protection provided by the state normative documents; - to monitor the state of occupational safety at workplaces; - Depending on the production position of a specialist, to conduct special documentation.	Interconnection with representatives of the social insurance fund from accidents at work and the relevant labour protection services.	To be responsible - for the life and health of the subordinate staff; - for creating safe working conditions; - for the correctness of the investigation of accidents at work.

4.5. State examination courses

Criteria for assessing the knowledge and skills of students are developed on all subjects, taking into account the specific nature of instructor-led classes and independent work of students.

The development of criteria for assessing students‘ knowledge is based on the "Regulations on the organization of educational process in higher educational institutions", approved by the order №161 of the Ministry of Education and Science of Ukraine of 02.06.1993 (section control measures), «Methodical recommendations for implementation of 3-4 levels of accreditation of certain normative and educational materials on the credit-module system of educational process organization in agrarian higher educational institutions of Ukraine» and scientific and methodological materials «Principles and ways of integration of higher educational institutions of the Ministry of Agrarian Policy of Ukraine into the European Higher Education Area"of the NMC of Agrarian Education of the Ministry of Agrarian Policy of Ukraine, Regulations on the organization of the educational process in the Sumy National Agrarian University and Regulations on the state attestation of students of SNAU.

The Methodical Council of Sumy NAU has developed criteria for assessing students' knowledge, skills and abilities for all academic disciplines in accordance with the credit - module system of knowledge assessment. Each teacher applies a (100-point) knowledge assessment system, which is to be introduced to students at the beginning of the course, and according to the points scored and the final knowledge control, the student receives an assessment on the national scale and the ECTS scale.

Teachers of the chairs who carry out the training of specialists in the specialty use modern innovative forms and methods of teaching and diagnostics of knowledge that promotes the activation

of students' learning and cognitive activity, maintenance of systemic scientific thinking, the skills of independent work and decision making, the reproduction of real professional situations and the formation of professional skills. With the purpose of the current monitoring of the students' knowledge, the department members of the chairs improve existing computer test forms of cross-cutting knowledge, which allow to effectively and efficiently evaluate the degree of mastery of the discipline material.

Control measures include current and final semester control and measures of state certification and are regulated by the provisions of the SNAU "On current and final control of student knowledge" and "On the procedure for the establishment, organization and work of the State Examination Commission at the SNAU".The current control is carried out during the training sessions and is aimed at verifying the level of mastering the student's material. The form of ongoing control during the training sessions and the system for assessing the level of knowledge is determined by the relevant department. Semester control is carried out in the form of a semester examination, a score, or a differentiated score on a specific academic discipline in the amount of the training material determined by the work syllabus of the academic discipline, in terms defined by the curriculum or the individual student's curriculum.

Settlement is a form of final control, which consists in evaluating the results of training in the discipline on the basis of current control and does not require a student's presence. Differentiated credit is a form of final control, which consists in assessing the level of competence formation based on individual tasks performed by the student (course papers, reports on practice, etc.), and involves the student's mandatory presence.In addition, the department created a department for monitoring the quality of training specialists to implement targeted monitoring of the quality of services and academic achievements of students, the introduction of a university system of quality management and for timely implementation of corrective actions aimed at improving the quality of training specialists in accordance with the modern needs of society.

The department for monitoring the quality of training of specialists is an independent structural unit whose tasks are:

- organization and conducting of systematic independent monitoring of the quality of training specialists and the formation on this basis of recommendations for the improvement of all components of the educational process;
- conducting questionnaires for students in order to determine the quality of educational services received;
- analysis of licensing conditions for the provision of educational services in the field of higher education;
- verification of accounting and accounting documents on the organization of the educational process;
- analysis of the correspondence of basic education of scientific and pedagogical staff of the discipline profile;
- analysis of migration flows of applicants according to the results of the admission campaign;
- provision of advisory and methodological assistance on the quality of training of specialists to participants (departments, teachers and students) of monitoring activities;

Forms of certification of applicants for higher education

State certification consists of two stages. The first stage is conducted in the form of independent remote diagnostics of the level of knowledge of graduates. The results are defined as "passed", "failed". The second stage is carried out in the form state qualifying exam or qualifying master's work.

Requirements for qualification work

Master's work is carried out on the subject of programmatic learning outcomes and must be checked for plagiarism. The manuscript submitted to the defence is accompanied by an abstract with

an annotation, a scientific supervisor's response, a feedback letter from the organization where the research was conducted, a review from the teacher. Master's thesis publication is published in the depository (on the official site) of the institution of higher education.

4.6. External chairman of the State Exam and Theses Defence Committees

The Examining Commission consisting of the Chairman and members of the commission is created annually and operates during the calendar year.The chairman of the commission is appointed by the rector of the university not later than two months before the beginning of the work of the leading specialists of the industry, as a rule, representatives of state and non-state enterprises, institutions, highly skilled workers of the institutes of the National Academy of Sciences of Ukraine or other state academies (by their consent)higher educational institutions, which train specialists in the same direction and specialties.

One and the same person may be the chairman of the commission for no more than three years in a row.The deputy chairman of the commission (if necessary) may be appointed vice-rector for scientific and pedagogical work, the dean of the faculty, the head of the graduate department or one of the members of the State Commission.

The personal composition of the State Commission with the indication of its duties is approved by the order of the rector of the university not later than a month before commencement of work of the commission.

The chairmen of the examination commission for the examination of masters training and the assignment of the educational degree to them "Master" in the direction of preparation 20 “Agricultural Sciences and Food”.

5. Evaluation of the Study Programme

5.1. Basic statistics

In Sumy NAU the training of specialists in the specialty "Agroengineering" began in 1978. The licensed volume of admission to the Department of Agroengineering as of 01.10.2017 is 150 persons of the Master "OS". The number of students as of 01.10.2017, who are studying at the "Master‘s" degree of education, is 246 people, of which 245 are from Ukraine and 1 is a foreign student. The contingent of the first year of study is 142 people, including 51 people of full-time education (46 budget and 96 commercial), 140 male and 2 female students; 134 were graduates of the Sumy NAU and 8 other educational institutions. The contingent of the second year of study is 106 people, including 15 persons of full-time education (46 budget and 60 commercial), 104 male and 2 female students; 96 were graduates of the Sumy NAU and 10 other educational institutions. The teaching process at the Engineering and Technology Department is provided by 4 professors (23,5%), 13 assistant professors (76,5%). and 2 teachers (4%).

5.2. Nationalities of students

Currently one student from Zambia and the others from Ukraine study for the Master’s degree. However, in general, 12 foreign students from Turkmenistan study at the Engineering and Technology Department.

5.3. Success rate of current graduate

Results of the session of students of specialty 208 Agroengineering Master "Master" in 2016-2017 academic year*

Course	Total students at the beginning of the session	Incl. on academic leave	Total allowed for exams	Passed					Received an unsatisfactory score				Absolute success %	Quality of training,%
				on all subjects tutor the plan	just for an excellent evaluation	only good and excellent evaluation	on mixed grades	only satisfactorily	total	one	two	three		
1 m	69	-	69	69	2	40	19	10	-	-	-	-	100	58
2 m	50	-	50	50	2	27	14	9	-	-	-	-	100	54,0
Total in specialty	**119**	**-**	**119**	**119**	**4**	**67**	**33**	**19**	**-**	**-**	**-**	**-**	**100**	**56,3**

* for full-time education

All students (100%) successfully passed the final tests and received the qualification of the"Mechanic Engineer".

Current entrance examination process

For entrants to the master's degree on the basis of basic or full higher education, the competition score is calculated as the sum of the result of the professional test, the entrance exams in the foreign language and the average score of the application to the document on basic or complete higher education (calculated up to one hundred points).

The results of the professional written exam are evaluated by a four-point rating system ("excellent", "good", "satisfactory", "unsatisfactory"). "Satisfactorily" is the minimum point for participation in the competition.

The results of a written exam in a foreign language are evaluated by a four-point rating system ("excellent", "good", "satisfactory", "unsatisfactory"). "Satisfactorily" is the minimum point for participation in the competition.For admitted to the master's degree on the basis of basic or full higher education obtained in another specialty, an additional introductory test is established in the form of an interview, the result of which is evaluated by a two-point evaluation system (“admitted“, "not allowed").

Applicants who have received the assessment of "admitted" are allowed to compose a written examination in a foreign language and a professional examination.

Indicators of student contingent formation by specialty 208 Agroengineering "Master" degree

№	Indicator	Years	
		2016	**2017**
1	Licensed training	150	150
2	Enrolled, total (persons):	98	142
	including state order:	46	49
3	Applications filed for one place:	1,2	1,3
4	Competition of entrants to public procurement places:	3,3	2,4

5.4. Evaluation of courses by students

The total number of respondents was 96people.The survey was conducted on different subjects among Master’s degree studentsof the engineering and technology faculty.

Assessment of students' training is based on a sociological survey (questionnaire).Questions of the questionnaire concerned professional and certain personal qualities of the teacher (knowledge of the subject, ability to convey this knowledge to the student, responsibility, objectivity, exactingness, tolerance, benevolence), the state of methodological and didactic provision of the educational process (availability and quality of methodical manuals, recommendations, instructions, visual aids, media, etc.). The questionnaire was conducted on conditions of anonymity, while students could indicate only standardized typed characteristics such as sex and frequency of student attendance.

Subject and average surveys are in appendix B and C respectively.

5.5. Results of group discussion with students

The total number of focus group was 20Master's degree students: 10 first-year students and 10 second-year students.

Main positives about the study programme by students' opinion

- most teachers are fluent in material (87%) and their explanation is teachable (81%).
- teachers make good use of lectures and practical classes, apply multimedia and examples of production.
- teachers willingly advise students outside the classroom.

Main negatives about study programme by students' opinion

- some teachers (8%) are not interested in listening to their students and the latter turn away from the discipline.
- almost half of the students (43%) are not fully satisfied with the methods of interaction with teachers.
- some teachers (9%) are not at all interested in the success of their students.

To solve these problems, activities are being developed to improve the skills of teachers at the leading enterprises of the region and other regions of Ukraine. The lectures are conducted by representatives of other universities in the framework of grant activities, and lectures are conducted by representatives of profile enterprises.

Students received full information about results of survey and discussion of its main aspects from curators of groups.

5.6. Evaluation of courses by teachers

The total number of respondents was 17Master's degree teachers.

Questionnaire for a teachers of engineering-technology faculty of Sumy National Agrarian University

You receive a list of questions about teaching process. Please rate your answers: "5" – very high; "4" – high; "3" – enough, "2" – low; "1" – very low. Place mark in the cell that corresponds to your chosen rating.

	Question	**1**	**2**	**3**	**4**	**5**
1	How well do I teach my subject?					
2	How relevant is the subject in this course?					
3	How competent am I in this subject?					
4	Is my teaching clear for students?					
5	How busy is my schedule?					
6	How much material and technical support for the subject does correspond?					
7	How interested are students in the studying of the subject?					
8	How well is the feedback in class?					
9	How accessible is the information for students?					
10	Evaluate your access to modern data bases for renewal of studying materials?					

Main positives about the study programme by teachers' opinion:

- according to results of teacher's survey average answers to questions № 1-4 are very high;
- studying materials are completely accessible for students because of Moodle system anytime;
- the feedback of students is high;
- lever of students' interest in different subjects varies from enough (3) to very high (5)

Main negatives about study programme by teachers' opinion:

- busy schedule. As a result, demand of more time for renewal of studying materials;
- insufficient access to modern scientific data bases;
- material and technical support for subjects are enough, but can be improved.

Problem of technical support will be solved to the summer of 2019 because of the project of winter educational module with soil heating system for the control of quality of technical operations and machine settings. Besides, Claas and Elvorti laboratories are being developed. Continuous renewal of existing laboratories with modern units of agricultural machines and control systems is also taking place.

Administration of the University realize the need for access to modern scientific data bases and are finding the ways of financial support for solving of this problem.

5.7. Report from alumni questionnaire

In the preparatory period (the first semester of the academic year), the department of employment of the SNAU, the dean's office of engineering-technological faculty, the graduating department conduct activities that promote further employment of graduates - bachelors and preparation for the passage of industrial practice: meetings with heads of enterprises and organizations, staffing services in the organization of employment, holding "Days of Career", participation in exhibitions, conferences, thematic meetings with university graduates who hold senior positions in the body of state power and local self-government, enterprises and organizations of different forms of ownership.

SNAU constantly maintains links with graduates who have studied at the faculty, traces their career growth, uses this experience in upbringing of junior students. Traditionally meetings with graduates were held every year in the second semester of the initial year. The most popular wishes of graduates:

- regular improvement of the material and technical base of the faculty based on production requirements;
- to increase the percentage of students undergoing training in production farms;
- to conduct internships for students and teachers abroad;
- to prepare students for a particular farm.

The questionnaire of engineering-technologyfaculty graduates of SNAU is carried out in two formats. The first – after completing the training, after the state attestation. The second – during the meeting of graduates of different years.

The scientific purpose of the study is to modify and improve existing quality assessment technologies (including Western ones) on the basis of a personality-activity approach, as well as develop and test new tools for determining the quality of educational services through their subjective assessment by graduates and their employers.

The practical purpose of the study is to identify the existing quality level of educational services provided at the engineering-technologyfaculty of SNAU, which in turn would serve as the basis for defining strategic goals and individual tactics of the Faculty and University Quality of Education Center.

The main methods of research are questionnaires and surveys.

In the 2016-2017 surveys were conducted by 129 people.

The questionnaire for graduates consisted of three blocks of questions:

I block – questions about the value of the individual disciplines' content for the professional activities of young engineers.

II block – questions of professional skills and abilities obtaining.

III block – open questions that revealed difficulties during the graduates' professional activities and suggestions on improving the professional training at the engineering-technologyfaculty of SNAU.

According to the results of the questionnaire:

I block – questions about the value of the individual disciplines' content for the professional activities of young engineers positively evaluated engineering-technologyfaculty's activity 91 % of respondents.

II block – questions of professional skills and abilities obtaining positively evaluated engineering-technologyfaculty's activity 96 % of respondents.

III block – open questions that revealed difficulties during the graduates' professional activities and suggestions on improving the professional training at the engineering-technologyfaculty of SNAU positively evaluated engineering-technologyfaculty's activity 80 % of respondents. At the same time, the most difficult disciplines were "Technology of Repair of Cars", "Machine-Use in Plant Growing (Installation and Commissioning)". Individual graduates emphasized the need to study in more details the disciplines "Repair of Cars", "The use of the Machinery in the Agro-Industrial Complex", "Engineering Networks and Constructions in Agro-Industrial Complex", "The Theory of Agricultural Machines and Advanced Technologies in Agro-Industrial Complex".

Questionnaire for a graduate of engineering-technology faculty of Sumy National Agrarian University is in the appendix C.

5.8. Data on employability of graduates

Sumy National Agrarian University graduates are sent to leading agricultural enterprises, farms, to regional district administrations of Sumy, Chernihiv and other regions of Ukraine. Sumy Oblast is 49%, Sumy - 24%, Chernihiv Oblast - 14%, other oblasts - 13%. Since December 2010, the University has started the tradition of holding a state division of young specialists with the participation of heads of enterprises who need staffing. Representatives of the Sumy Regional State Administration and the Main Directorate of Agro-Industrial Development are invited to this event. During distribution, the commission is considering the issues of recruiting young specialists in detail, taking into account social and living conditions, namely: wages, housing, living conditions, transport links, social guarantees, and so on.

Examples of recent programme graduates

List of graduates of Engineering and TechnologyDepartment of Sumy NAU, who hold the leading positions:

Turchyn Petro Ivanovych - Deputy Director of the Department of Agro-Industrial Development of the Sumy Regional State Administration;

Karpenko Serhii Mykhailovych - director of "Khlibodar" LLC;

Kovalenko Evhen Mykhailovych - Director of LLC "Promin";

Horovyi Dmytro Mykhailovych - Director of Service LLC Jupiter 9 Agroservice (distributor of agricultural machinery - John Deere, Manitou, Väderstad);

Omelchenko Evhen Mykhailovych - Director of regional representation Agrotehsoyuz (distributor of agricultural machinery - Claas, Lemken, Horsch, Valley);

Sidorko Anton Anatoliiovych - director of the regional representation of UkrFarming (distributor of agricultural machinery - Case IH, Lemken, Mascio Gaspardo i Fantini);

Spaskykh Dmytro Mykolaiovych - Chief Engineer of Vorozbalyatinvest LLC NCH Capital («Agroproperis»);

Shevchenko Mykhailo Romanovych - Chief Engineer of Precision Farming Systems Agro-holding AgroEpicenter,

Hilev Serhii – Produktmanager Traktoren, Ersatzteile/Zubehör in Argo Traktoren GmbH.

5.9. Scientific outcomes of course supervisors

Subjects	Guarantor	Experience	Number of publications	Patents	H-index Google Scholar
Pedagogy (engineering)	Dubovyk S.G.	23 years	25	-	2
Legislation and Law in Agro-industrial Complex	Zapara S.I.	24	100	-	4
World Agricultural Production	Mykhailova L.I.	30	89	11	9
Theory and Technology of Scientific Researches and Analysis of Technological Systems	Tarelnyk VB	41	350	60	6
The use of the Machinery in the Agro-Industrial Complex	Hetsovych Y.M.	47	130	139	5
Repair of Cars	Iaremenko V.P.	38	70	17	3
Engineering Management	Turchyna S.G.	26	70	-	2
Labour Protection in Industry, Ecology of Labour and Civil Protection	Shandyba O.B.	27	85	11	4
Tribotechnology	Tarelnyk V.B.	41	350	60	6
Energy Supply and Transportation in the Agro-Industrial Complex	Hetsovych Y.M.	47	130	139	5
Engineering Networks and Constructions in Agro-Industrial Complex	Semirnenko Y.I.	24	70	20	2
The Theory of Agricultural Machines and Advanced Technologies in Agro-Industrial Complex	Zubko V.M.	10			3
The Theory of Tractors and Cars and the Automatic Control System of Braking and Dispersal of Wheeled Vehicles	Hetsovych Y.M.	47	130	139	5
Estimation of Efficiency of Engineering Decisions	Semirnenko Y.I.	24	70	20	2
Geographic Information Systems and Precision Farming System	Sarzhanov O.A.	31	100	21	2
Quality Management	Rudenko V.P.	40	110	20	3
Stock Market	Turchyna S.G.	26	70	-	2
Biofuels: Efficiency of their Production and Consumption in the Ukrainian Agro-Industrial Complex	Semirnenko Y.I.	24	70	20	2
Mechanized Technologies in Plant Growing	Barabash G.I.	44	110	24	2

Maintenance of Machines for Plant Growing	Sarzhanov O.A.	31	100	21	2
Machine-Use in Plant Growing (Installation and Commissioning)	Iaroshenko P. M	27	30	10	2
Design of Technological Processes in Crop Production	Sarzhanov O.A.	31	100	21	2
Technology of Maintenance of Machines	Bondarev S.G.	28	34	21	2
Organization of Works for Maintenance Enterprises	Konoplianchenko Y.V.	20	300	20	2
Technology of Repair of Cars	Iaremenko V. P.	38	70	17	3
Designing of Technological Processes of Technical Service	Tarelnyk V.B.	41	350	60	6

5.10. Availability of study materials

A powerful information centre for providing all subscribers with available information resources, fixed in accordance with certain standards, is the university library.The information and education environment of the university consists of a site, an electronic portal, a subsystem of distance learning, an electronic library and a repository, a virtual student employment office. The use of these resources allows each student and teacher to work with the teaching and methodological provision of courses, use library resources, be able to control their success, download, form electronic journals, etc.

In order to ensure regular access to WEB-resources, network technologies Intranet and Internet are used. Educational buildings, public places on the territory of SNAU and hostels have Wi-Fi coverage with free internet connection.Innovative information and communication technologies of education are widely used in the training process for the training of specialists. The use of applied software products is provided by the curriculum of training specialists and consists of various types of work.

Computer technology training is used to perform situational tasks at practical classes and seminars, as well as in the organization of students' independent and individual work.

The creation of information and learning space based on the Moodle platform provides students with full methodological support for theoretical, practical courses, independent work, as well as online contact between the teacher and the student.

№	Name of discipline	Availability information("+", "-")				
		educational content, electronic textbooks	tasks of laboratory-practical work	tasks for independent work of students	PPT in Moodle	Educational methodical complex
I. NORMATIVE EDUCATIONAL DISCIPLINES						
1.1. The cycle of disciplines of general preparation						
1	Pedagogy (Engineering)	+	+	+	+	+
2	Legislation and Law in the Agro-Industrial Complex	+	+	+	+	+
3	The World Agricultural Production	+	+	+	+	+
1.2. Cycle of disciplines of professional and practical training						
1	Theory and Technology of Scientific Researches and Analysis of Technological	+	+	+	+	+

	Systems					
2	Use of Machinery in Agro-Industrial Complex	+	+	+	+	+
3	Repair of Machines	+	+	+	+	+
4	Engineering Management	+	+	+	+	+
5	Labour Protection in the Industry, Work Environment and Civil Protection	+	+	+	+	+
II. Selective Educational Disciples						
2.1. Discipline of the individual choice of the educational institution						
1	Tribotechnology	+	+	+	+	+
2	Power Supply and Transportation in Agro-Industrial Complex	+	+	+	+	+
3	Engineering networks and constructions in Agro-industrial Complex	+	+	+	+	+
4	The Theory of Agricultural Machines and Advanced Technologies in Agro-Industrial Complex	+	+	+	+	+
5	The Theory of Tractors and Cars and Automatic Control System for Braking and Dispersal of Wheeled Cars	+	+	+	+	+
6	An Estimation of Efficiency of Engineering Decisions	+	+	+	+	+
7	Geoinformation Systems and Precision Farming System	+	+	+	+	+
8	Quality Management	+	+	+	+	+
9	Exchange Market	+	+	+	+	+
10	Biofuels: Efficiency of their Production and Consumption in Agro-Industrial Complex of Ukraine	+	+	+	+	+
2.2. Disciplines of a student's free choice						
2.2.1. Master's program "Mechanization of plant growing"						
1	Mechanized Technologies in Plant Growing	+	+	+	+	+
2	Maintenance of Machines for Plant Growing	+	+	+	+	+
3	Machine Use in Crop Production (Installation and Commissioning)	+	+	+	+	+
4	Design of Technological Processes in Crop Production	+	+	+	+	+
2.2.2. Master's program "Technical service"						
1	Technology of Maintenance of Machines	+	+	+	+	+
2	Organization of work of Enterprises of Technical	+	+	+	+	+

	Maintenance					
3	Technology of Repair of Cars	+	+	+	+	+
4	Design of Technological Processes of Technical Service	+	+	+	+	+

List of professional periodicals

№	Title of the periodical publications	Years of income
1.	Agroexpert: Publications on Ukrainian and World Agricultural Practices	2009–2015
2.	THE UKRAINIAN FARMER	2015–2016
3.	Agricultural science	2007–2015
4.	An agronomist + Agricultural machinery and equipment	2006–2012 2015–2016
5.	Alternative Energy Sources. Ukrainian magazine on alternative energy sources	2010–2015
6.	Bioenergy: All-Ukrainian Scientific and Production Magazine	2015–2016
7.	Bulletin of Agrarian Science: Scientific and Theoretical Journal of the Ukrainian Academy of Agrarian Sciences	2003–2015
8.	Achievements of science and technology in the agroindustrial complex	2006–2008
9.	Ecology. Abstract journal.	2016
10.	Economy of agro-industrial complex. International Scientific and Production Magazine.	2009–2011
11.	Ukraine economy	2000–2012
12.	Electrification and automation of agriculture	2009–2015
13.	Land law of Ukraine. Theory and practice	2006–2012, 2014
14.	Grain	2014–2016
15.	Integrated technologies and energy saving	2011–2012
16.	Management and marketing	2003–2011
17.	Agricultural machinery news	2010–2012
18.	New Agriculture: Journal of Agronomy	2005–2015
19.	Labour Safety	2000–2012
20.	Suggestion: Monthly Information Publication. New Agriculture: Journal of Agronomy	2000–2012, 2015–2016
21.	Rural engineer mechanic	2005–2010
22.	Agriculture. Systematic index of foreign literature	2010–2012
23.	Standardization, certification, quality	2001–2012, 2015–2016
24.	Animal husbandry of Ukraine. Scientometric journal	2010–2016
25.	Engineering in agriculture	2005–2009
26.	Appliances and technologies of agrarian and industrial complex: scientific and production magazine	2011–2012, 2015–2016
27.	Machinery and Technology of agro-industrial complex	2015–2016
28.	Ukraine Driving	2010–2016
29.	Food and processing industry	2001–2012
30.	Storage and processing of grain	2000–2012
31.	Ukraine’s sugar. Scientific and practical branch magazine	2016
32.	Ecology	2016

5.11. Inter-connection and structure of teaching and examination methods of individual courses

Our life requires effective management of the training of future specialists on a scientific basis, taking into account the basic requirements for the formation of a modern competent specialist. Observance of interdisciplinary connections is one of the important psychological and pedagogical conditions for increasing the scientific and educational availability, its connection with the surrounding reality, activating of preparatory activity and improving the process of formation of knowledge, skills and abilities of subjects of study.

Similar sciences contribute to better knowledge of objects and the establishment of deep links between concepts. The principle of interdisciplinary integration is the main mechanism for optimizing the structure of the model of knowledge and system of educational disciplines, which transforms the whole system of training into the theoretical, technological and methodical means of constructing models of professional activity of the engineer.

In order to improve the quality of learning the student's material, the work of teachers, in the preparation of training courses, is aimed at:

1) search for new approaches to armament of future specialists with good knowledge of the foundations of science, formation of a conscious attitude towards them, proper level of professional competence;

2) significant improvement of the content and methods of teaching, increasing the effectiveness of the educational process in the Sumy NAU.

For high-quality professional training of up-to-date mechanic engineer, it is important to increase the effectiveness of teaching methods and adhere to the principles of managerial cognitive activity of the student.

In order to analyse the quality of training courses, each department has established committees for analysing the quality of training courses. Relevant commissions constantly monitor the training courses and control the mastering of material by students. On the basis of the received results, they make suggestions for their improvement. The relevant information is analysed by the University Quality Department.

5.12. Evaluation of teachers

According to the students, the best teachers of this curriculum in 2017 were: Gorovoy M. V, Konoplianchenko E.V., Saenko A. V.

The best scientists of Engineering and TechnologyDepartment (H-index)

1. Professor Tarelnyk Vyacheslav - 6

2. Professor Hetsovych Yugene - 5

3. Professor Mykhailova Liubov - 9

5.13. Participation of external experts and foreigner teachers

In 2017, the following lecturers were invited:

J.H. (Rene) Kremers – Managing director Difco International,
Voloshyn Andrii – leading expert in precision farming systems Case IH AFS,
Gulko Andrey – Account Manager – Central and Eastern Europe Raven,
Yohan Tatsber – an advisor on agricultural issues of the company CASE IH,
Hruzdo Mykola – Chief Engineer of Farm Enterprise "Svitanok",
Spaskykh Dmytro – Chief Engineer of Farm Enterprise «Vorozhbalatinvest», NCH Capital («Ahroprosperys»).

Internationalization – number of student mobilities per academic year

Studying abroad, internships and internships

	2014 /2015 e.y.	2015/2016 e.y.	2016/2017 e.y.
Germany	2	26	34
Poland	6	10	31
USA	3	3	6
Switzerland	8	10	5
Denmark	1	1	2
Sweden	-	2	1

5.14. List of topics for MSc Thesis

1. Analysis and increase of efficiency of technological process of grain drying.
2. Improvement of the technology of repair of compressors of central conditioning.
3. Improvement of the technology of growing crops using the non-grain part of the crop as a fuel.
4. Improvement of the technology of restoring parts like shaft.
5. Improvement of the technology of increasing the durability of a metal cutting tool by laser treatment.
6. Research of technological operations of basic soil cultivation for sunflower seed.
7. Investigation of the causes of wear and the substantiation of energy-efficient technology for increase of the efficiency of the components of the KSHM diesel engines of wheeled tractors.
8. Comparative estimation and feasibility study of the technological processes of corn harvesting for grain.
9. Improvement of technology of recycling of primary processing of grain crops.
10. Improvement of designs of gas cylinders of agricultural machines.
11. Research of technological processes for the care of winter wheat crops and justification of the choice for their implementation.
12. Investigation of the wear process and the justification of resource-saving technology for the restoration of parts of the annual analysis of a combine harvester.
13. Research of technological processes of sowing of cultivated crops using navigation systems.
14. Research of the efficiency of harvesting of grain crops.
15. Research and substantiation of technical means for mechanized cultivation of soil for corn.
16. Substantiation of energy-efficient technology for increase of the wear resistance of tribosurfaces of parts of working bodies of agricultural machines.
17. Investigation of mechanical impurities in the lubricant of the engine of the car "Gazelle".
18. Improvement of the technology of restoration of working bodies of soil-working machines.
19. Analysis and substantiation of the technological process of soil cultivation.
20. Research of technological processes of corn harvesting on silo and substantiation of technical means for their implementation.
21. Modern innovative solutions in cultivation technology to harvest corn on silage.
22. Justification of the scheme of a combined water-lifting unit based on a wind turbine.
23. Improvement of the technology of animal waste utilization.
24. Investigation of the technological process of corn sowing for grain and silage.

25. Research of technological processes of sunflower seeding and substantiation of the choice of technical means for their implementation.

26. Mechanization of technological process of production of flour with estimation of energy costs.

27. Research of technological operations of pre-sowing tillage in the field of sunflower growing.

28. Investigation and application of requirements of technical regulations of Ukraine for agricultural machinery and equipment.

29. Justification of resource-saving technology for strengthening and improving wear-resistance of working bodies of soil-working machinery.

30. Investigation of causes of wear and justification of resource saving technology for the restoration of working surfaces of parts of agricultural machinery pumps.

31. Improvement of the efficiency of the anti-lock system of the truck.

32. Improvement of the technology of using straw biomass of agricultural crops.

33. Improvement of the production of bioenergy fuels from sunflower peeling.

34. Analysis of the compaction of agricultural machines on the soil and measures to reduce it.

35. Improvement of the technology of increasing durability of flexible elements of coupling friction corrosion.

36. Improvement of the technology of corn waste utilization.

37. Improvement of structures of working units of agricultural implements.

38. Research of technological processes of sowing of winter cereals.

39. Analysis and justification of the expediency of using navigation systems in transport.

40. Improvement of the technology of drying grain of high humidity.

41. Improvement of the efficiency of utilization of machinery and tractor fleet waste by gasification.

42. Development of cogeneration unit.

43. Investigation of the influence of screw lines as structural elements of agricultural implements on the efficiency of their use.

44. Research of technological processes of corn harvesting for grain and substantiation of the choice of technical means for their implementation.

45. Improvement of the technology of increasing the durability of hammer crushers.

46.Improvement of the technology of restoration of working bodies of soil-working machines.

47. Research of scattering working bodies of machines for fertilizing.

48. Development of technology for utilization of cattle manure.

49. Mechanization of technical process of flour production using pneumatic transport of grain and flour.

50. Substantiation of energy-efficient technology for the restoration of details of the fuel system of diesel engines.

51. Analysis of grain dryers and substantiation of grain drying process.

52. Research of wear resistance of a cylinder-piston group of automotive tractor engines.

53. Improvement ofthe technology of repairing of root knives.

54. Improvement of the technology of waste recycling.

55. Analysis and substantiation of the technological process of soil cultivation.

56. Improvement of shaping of variational geometric models of technical objects based on the method of polyparameter.

57. Study of the effectiveness of agricultural machinery preparation for storage.

58. Innovative solutions in the technology of corn harvesting for grain.

59. Research of methods of harvesting winter crops.

60. Analysis and justification of the efficiency of using the system of precision agriculture.

61. Investigation of indicators of quality of work of agricultural machines when growing

corn for grain.

62. Prospects for the production and use of alternative fuels for diesel engines.

63. Justification of resource-saving technology of restoration of transmission parts of wheeled tractors.

64. Development of technology for the recycling of grain crops with the aim of obtaining composite fuel.

65. Improvement of the technology of increasing the stability of the metal cutting tool by condensed ion bombardment.

66. Improvement of technological processes of utilization of organic wastes with ecological substantiation of engineering decisions.

67. Improvement of the technology of increasing the durability of the Babbitan bearings of sliding.

5.15. Overall Results of the MSc Final State Exams

In 2017, 49 master's works were prepared and defended.

The analysis of the structure of works showed that the themes of the works are relevant. In master's works, usually from 5 to 8 tables, from 3 to 6 drawing, charts, photographs.In the lists of used literature from 20 to 50 sources.

Masters have publications of scientific works. Graduates reasoned and clearly reported the main provisions of their master's thesis, responded to questions from members of the commission and comments from reviewers. Graduates are theoretically and practically trained, have modern approaches in solving certain scientific issues. The results of the defence of master's works are presented in the table:

Results of defence of master's works

The number of defendants	**mark**			**Average score**
	Excellent	**Good**	**Satisfactorily**	
49	33	14	2	4,6

The examination commission believes that the bulk of the master's thesis is executed on topical topics, the results of some of the research studies proposed for use in production.

Results of the issue, use and adaptation of graduates of specialty 208 "Agroengineering" OS "Magister"

№ з/п	**Indicator**	**Years**	
		2016	**2017**
1.	Number of graduates (total):	80	49
2.	Number of graduates with honours (total):	-	-
3.	The share of graduates who have passed the state examination or defended theses on "excellent" and "good" (%)	79	47
4.	The share of theses executed with the use of computers (%)	100	100
5.	Share of theses executed to order of enterprises (%)	96,25	91,8
6.	The share of graduates protected at enterprises (%)	10,4	18,2
7.	Share of works recommended by the EC to implementation (%)	25	28
8.	The share of graduates who studied under the state order and received their destination (%)	100	100
9.	The share of graduates recommended for postgraduate studies (%): a) of them are enrolled in postgraduate studies	3,8 2,5	6,1 2,0
10.	Share of graduates where the educational institution has data on their place of work and position (%)	100	100

6. Final internal and external review and concluding remarks

The results of the curriculum and the survey of graduates indicate that the level of masters training in the engineering of Sumy National Agrarian University meets the modern requirements.

The results of the defence of diploma papers and passing of complex state examinations by graduates of the engineering-technological faculty testify that the staff of the faculty preparessuccessfully the masters in engineering. 2017 graduates in the vast majority have sufficient knowledge to solve production problems. Graduates of the magistracy learn to work in scientific and educational institutions according to their specialty.

On the basis of the report and the results of the surveys, it has been established that it is necessary:

- to promote and stimulate the development of student science,
- to involve students in scientific work,
- taking into account their skills and results of passing industrial practices in production,
- to pay more attention to the study of modern methods of conducting research.

Appenix A

The results of the students' questionnaire regarding the evaluation of professor's work

"The use of the machinery in the agro-industrial complex"

Professor Hetsovych Y.M.

The survey was attended by 33 students

We have analyzed the student' answers to the questionnaire and received the following results:

№	Question	*Results of answers (%)*		
		So	*Part*	*No*
1	The teacher knows his subject, has deep knowledge of the material	*100%*	-	-
2	The teacher's explanation is accessible to the perception	*100%*	-	-
3	The objectives of the classes held by the teacher are clear to me	*100%*	-	-
4	The results of my knowledge and skills prove the achievement of the goals	*100%*	-	-
6	Does the teaching material include practical features and examples?	*100%*	-	-
7	Will you be satisfied with the use of technical means and the latest technology in the teaching of material?	*100%*	-	-
8	Methodsofinteractionwithstudentsprovidequalityassimilatio nofknowledgeduringclassroomclasses	*100%*	-	-
9	Out of these types of classes (forum of work) are implemented in the educational process by the teacher at the university most of all:	** active lectures - 100%;* ** classes with the use of information technology - 67%;* ** production trainings - 33%;* ** analysis and solution of practical situations - 67%.*		
10	Do you understand the teacher's requirements, the criteria for evaluating your work?	*100%*	-	-
11	The instructor informs on the results of the tested tasks on time.	-	-	-
12	Does your grade match your teacher's grade?	*100%*	-	-
13.	Does the teacher objectively assess the level of your knowledge and skills			
	* oral questioning	*100%*	-	-
	* independent work checking	*100%*	-	-
	* reports on creative tasks	*100%*	-	-
	* modular control works	*100%*	-	-
	* computer certifications	*100%*	-	-
	* credits	*100%*	-	-
	* examinations	*100%*	-	-

15	The instructor is interested in the academic achievements of students	*100%*	-	-
16	Teacher is sensitive to students, is ready to provide advice	*67%*	*33%*	-
17	The teacher adheres to ethical norms of communication.	*100%*	-	-
18	Does the teacher take into account your interests, abilities and psychological peculiarities?	*33%*	*67%*	-
19	Howistheteachingprocessorganizedbytheteacherandwhether youtakepartinit?	*Organization:* *well organized - 33%;* **unorganized - 67%.*		*Your participation:* ** I am developing a specific problem - 0%;* ** I take part in conferences, write articles - 0%;* ** I do not take part - 100%.*
20	Does your teacher consult you and how does he control the research	*Consult:* ** according to the schedule - 100%;* ** with a deviation from the schedule - 0%.*		*Control:* ** permanent - 67%;* ** episodic - 33%.*
21	If your friend wanted to study at our institution for your specialty what would you advise to him (you must emphasize):	**join, because the speciality is in-demand – 30%;* ** join in spite of difficulty of speciality – 10%;* ** join because of lots of practical experience of real work in agricultural companies – 17%;* ** think it over, because the specialty is difficult to master – 33%.*		

Please tell us about yourself:
Sex: I'm attending classes: Always (100%) – 33% visit from the group;
Male [100%] Very often (>75%) – 67% visit from the group
Female [0%]

The results of the students' questionnaire regarding the evaluation of professor's work

"Repair of Cars**"**

Assistant professor Iaremenko V.P.

The survey was attended by 32 students

We have analyzed the student' answers to the questionnaire and received the following results:

№	Question	*Results of answers (%)*		
		So	*Part*	*No*
1	The teacher knows his subject, has deep knowledge of the material	*100%*	-	-
2	The teacher's explanation is accessible to the perception	*100%*	-	-
3	The objectives of the classes held by the teacher are clear to me	*100%*	-	-
4	The results of my knowledge and skills prove the achievement of the goals	*100%*	-	-
6	Does the teaching material include practical features and examples?	*100%*	-	-
7	Will you be satisfied with the use of technical means and the latest technology in the teaching of material?	*100%*	-	-
8	Methodsofinteractionwithstudentsprovidequalityassimilatio nofknowledgeduringclassroomclasses	*100%*	-	-
9	Out of these types of classes (forum of work) are implemented in the educational process by the teacher at the university most of all:	** active lectures - 100%;* ** classes with the use of information technology - 100%;* ** production trainings - 33%;* **scientific work – 67 %;* ** analysis and solution of practical situations - 67%.*		
10	Do you understand the teacher's requirements, the criteria for evaluating your work?	*100%*	-	-
11	The instructor informs on the results of the tested tasks on time.	*100%*	-	-
12	Does your grade match your teacher's grade?	*100%*	-	-
13.	Does the teacher objectively assess the level of your knowledge and skills			
	* oral questioning	*100%*	-	-
	* independent work checking	*67%*	*33%*	-
	* reports on creative tasks	*67%*	*33%*	-
	* modular control works	*67%*	*33%*	-
	* computer certifications	*33%*	*67%*	-
	* credits	*67%*	*33%*	-
	* examinations	*100%*	-	-

15	The instructor is interested in the academic achievements of students	*100%*	-	-
16	Teacher is sensitive to students, is ready to provide advice	*100%*	-	-
17	The teacher adheres to ethical norms of communication.	*100%*	-	-
18	Does the teacher take into account your interests, abilities and psychological peculiarities?	*100%*	-	-
19	Howistheteachingprocessorganizedbytheteacherandwhether youtakepartinit?	*Organization:* *well organized - 100%;* **unorganized - 0%.*		*Your participation:* ** I am developing a specific problem - 100%;* ** I take part in conferences, write articles - 33%;* ** I do not take part - 0%.*
20	Does your teacher consult you and how does he control the research	*Consult:* ** according to the schedule - 100%;* ** with a deviation from the schedule - 0%.*		*Control:* ** permanent - 100%;* ** episodic - 0%.*
21	If your friend wanted to study at our institution for your specialty what would you advise to him (you must emphasize):	**join, because the speciality is in-demand – 30%;* ** join in spite of difficulty of speciality – 40%;* ** join because of lots of practical experience of real work in agricultural companies – 30%;* ** think it over, because the specialty is difficult to master –0%.*		

Please tell us about yourself:
Sex: I'm attending classes: Always (100%) – 67% visit from the group;
Male [67%] Very often (>75%) – 33% visit from the group
Female [33%] Very often (>75%) – 75% visit from the group

The results of the students' questionnaire regarding the evaluation of professor's work

"The Theory of Agricultural Machines and Advanced Technologies in Agro-Industrial Complex**"**

Assistant Professor Zubko V.M.

The survey was attended by 29 students

We have analyzed the student' answers to the questionnaire and received the following results:

№	Question	*Results of answers (%)*		
		So	*Part*	*No*
1	The teacher knows his subject, has deep knowledge of the material	*100%*	-	-
2	The teacher's explanation is accessible to the perception	*100%*	-	-
3	The objectives of the classes held by the teacher are clear to me	*100%*	-	-
4	The results of my knowledge and skills prove the achievement of the goals	*100%*	-	-
6	Does the teaching material include practical features and examples?	*33%*	*67%*	-
7	Will you be satisfied with the use of technical means and the latest technology in the teaching of material?	*67%*	*33%*	-
8	Methodsofinteractionwithstudentsprovidequalityassimilatio nofknowledgeduringclassroomclasses	*100%*	-	-
9	Out of these types of classes (forum of work) are implemented in the educational process by the teacher at the university most of all:	** active lectures - 100%;* ** classes with the use of information technology - 67%;* ** analysisand solution of practical situations - 100%.*		
10	Do you understand the teacher's requirements, the criteria for evaluating your work?	*100%*	-	-
11	The instructor informs on the results of the tested tasks on time.	*100%*	-	-
12	Does your grade match your teacher's grade?	*100%*	-	-
13.	Does the teacher objectively assess the level of your knowledge and skills			
	* oral questioning	*100%*	-	-
	* independent work checking	*100%*	-	-
	* reports on creative tasks	*100%*	-	-
	* modular control works	*100%*	-	-
	* computer certifications	*100%*	-	-
	* credits	67%	*33%*	-

	* examinations	*100%*	-	-
15	The instructor is interested in the academic achievements of students	*67%*	*33%*	-
16	Teacher is sensitive to students, is ready to provide advice	*67%*	*33%*	
17	The teacher adheres to ethical norms of communication.	*100%*	-	-
18	Does the teacher take into account your interests, abilities and psychological peculiarities?	*100%*	-	-
19	Howistheteachingprocessorganizedbytheteacherandwhether youtakepartinit?	*Organization: well organized - 67%; *unorganized - 33%.*		*Your participation: * I am developing a specific problem - 67%; * I take part in conferences, write articles - 0%; * I do not take part - 33%.*
20	Does your teacher consult you and how does he control the research	*Consult: * according to the schedule - 100%; * with a deviation from the schedule - 0%.*		*Control: * permanent - 100%; * episodic - 0%.*
21	If your friend wanted to study at our institution for your specialty what would you advise to him (you must emphasize):	**join, because the speciality is in-demand – 40%; * join in spite of difficulty of speciality – 30%; * join because of lots of practical experience of real work in agricultural companies – 30%; * think it over, because the specialty is difficult to master –0%.*		

Please tell us about yourself:
Sex: I'm attending classes: Always (100%) – 67% visit from the group;
Male [100%] Very often (>75%) – 33% visit from the group
Female [0%]

The results of the students' questionnaire regarding the evaluation of professor's work

"The Machine-Use in Plant Growing (Installation and Commissioning)**"**

Assistant Professor Iaroshenko P. M

The survey was attended by 27 students

We have analyzed the student' answers to the questionnaire and received the following results:

№	Question	*Results of answers (%)*		
		So	*Part*	*No*
1	The teacher knows his subject, has deep knowledge of the material	*90%*	*10%*	-
2	The teacher's explanation is accessible to the perception	*90%*	*10%*	-
3	The objectives of the classes held by the teacher are clear to me	*70%*	*30%*	-
4	The results of my knowledge and skills prove the achievement of the goals	*80%*	*20%*	-
6	Does the teaching material include practical features and examples?	*90%*	*10%*	-
7	Will you be satisfied with the use of technical means and the latest technology in the teaching of material?	*90%*	*10%*	-
8	Methodsofinteractionwithstudentsprovidequalityassimilatio nofknowledgeduringclassroomclasses	*100%*	-	-
9	Out of these types of classes (forum of work) are implemented in the educational process by the teacher at the university most of all:	** active lectures - 90%;* ** classes with the use of information technology - 50%;* **scientific work – 30%;* ** analysis and solution of practical situations - 80%.*		
10	Do you understand the teacher's requirements, the criteria for evaluating your work?	*90%*	*10%*	-
11	The instructor informs on the results of the tested tasks on time.	*90%*	*10%*	-
12	Does your grade match your teacher's grade?	*60%*	*40%*	-
13.	Does the teacher objectively assess the level of your knowledge and skills			
	* oral questioning	*90%*	*10%*	-
	* independent work checking	*90%*	*10%*	-
	* reports on creative tasks	*90%*	*10%*	-
	* modular control works	*90%*	*10%*	-
	* computer certifications	*90%*	*10%*	-
	* credits	*90%*	*10%*	-
	* examinations	*90%*	*10%*	-

15	The instructor is interested in the academic achievements of students	*100%*	-	-
16	Teacher is sensitive to students, is ready to provide advice	*90%*	*10%*	-
17	The teacher adheres to ethical norms of communication.	*90%*	*10%*	-
18	Does the teacher take into account your interests, abilities and psychological peculiarities?	*80%*	*20%*	-
19	Howistheteachingprocessorganizedbytheteacherandwhether youtakepartinit?	*Organization:* *well organized - 90%;* **unorganized - 10%.*		*Your participation:* ** I am developing a specific problem - 10%;* ** I take part in conferences, write articles - 10%;* ** I do not take part - 80%.*
20	Does your teacher consult you and how does he control the research	*Consult:* ** according to the schedule - 80%;* ** with a deviation from the schedule - 20%.*		*Control:* ** permanent - 40%;* ** episodic - 60%.*
21	If your friend wanted to study at our institution for your specialty what would you advise to him (you must emphasize):	**join, because the speciality is in-demand – 42%;* ** join in spite of difficulty of speciality – 30%;* ** join because of lots of practical experience of real work in agricultural companies – 18%;* ** think it over, because the specialty is difficult to master – 10%.*		

Please tell us about yourself:
Sex: I'm attending classes: Always (100%) – 70% visit from the group;
Male [100%] Very often (>75%) – 30% visit from the group
Female [0%]

Appenix B

Average questionnaire concerned professional and certain personal qualities of the teacher

№	Question	*Results of answers (%)*		
		So	*Part*	*No*
1	The teacher knows his subject, has deep knowledge of the material	*98%*	*2%*	-
2	The teacher's explanation is accessible to the perception	*98%*	*2%*	-
3	The objectives of the classes held by the teacher are clear to me	*93%*	*7%*	-
4	The results of my knowledge and skills prove the achievement of the goals	*95%*	*5%*	-
6	Does the teaching material include practical features and examples?	*81%*	*9%*	-
7	Will you be satisfied with the use of technical means and the latest technology in the teaching of material?	*92%*	*8%*	-
8	Methodsofinteractionwithstudentsprovidequalityassimilationofknowledgeduringclassroomclasses	*95%*	*5%*	-
9	Out of these types of classes (forum of work) are implemented in the educational process by the teacher at the university most of all:	** active lectures - 98%;* ** classes with the use of information technology - 71%;* ** production trainings - 33%;* ** research work - 49%;* ** analysisand solution of practical situations - 79%.*		
10	Do you understand the teacher's requirements, the criteria for evaluating your work?	*98%*	*2%*	-
11	The instructor informs on the results of the tested tasks on time.	*98%*	*2%*	-
12	Does your grade match your teacher's grade?	*90%*	*10%*	-
13.	Does the teacher objectively assess the level of your knowledge and skills			
	* oral questioning	*98%*	*2%*	-
	* independent work checking	*89%*	*11%*	
	* reports on creative tasks	*89%*	*11%*	-
	* modular control works	*89%*	*11%*	-
	* computer certifications	*81%*	*19%*	-
	* credits	*81%*	*19%*	-
	* examinations	*98%*	*2%*	-
15	The instructor is interested in the academic achievements of students	*92%*	*8%*	-
16	Teacher is sensitive to students, is ready to provide advice	*81%*	*19%*	-

17	The teacher adheres to ethical norms of communication.	*98%*	*2%*	-
18	Does the teacher take into account your interests, abilities and psychological peculiarities?	*78%*	*22%*	-
19	Howistheteachingprocessorganizedbytheteacherandwhetheryoutake partinit?	*Organization: well organized - 73%; *unorganized - 21%.*		*Your participation: * I am developing a specific problem - 28%; * I take part in conferences, write articles - 28%; * I do not take part - 44%.*
20	Does your teacher consult you and how does he control the research	*Consult: * according to the schedule - 95%; * with a deviation from the schedule - 5%.*		*Control: * permanent - 76%; * episodic - 24%.*
21	If your friend wanted to study at our institution for your specialty what would you advise to him (you must emphasize):	**join, because the speciality is in-demand – 37%; * join in spite of difficulty of speciality – 27%; * join because of lots of practical experience of real work in agricultural companies – 23%; * think it over, because the specialty is difficult to master –13%.*		

Appendix C

Questionnaire for a graduate of engineering-technology faculty of Sumy National Agrarian University

GRADUATE'S PERSONAL DATA:

	last name	**first name**	**middle name**
in Ukrainian in the noun case			

Address: _____
_____
_____

E-mail: _____ Phone number: _____

Year of graduation:

I block – questions about the value of the individual disciplines' content for the professional activities of young engineers

1. First of all, you receive a list of courses that are included in the program for training specialists in Master Course of engineering-technology faculty of SNAU. Please rate how interesting they are for you personally. "5" – very interesting; "4" – interesting; "3" – from the title of the course it is difficult to determine whether it will be interesting, "2" – most likely, it will not be interesting; "1" – not at all interesting. Place mark in the cell that corresponds to your chosen rating.

#	Discipline	1	2	3	4	5
1	Pedagogy (engineering)					
2	Legislation and Law in Agro-industrial Complex					
3	World Agricultural Production					
4	Theory and Technology of Scientific Researches and Analysis of Technological Systems					
5	The use of the Machinery in the Agro-Industrial Complex					
6	Repair of Cars					
7	Engineering Management					
8	Labour Protection in Industry, Ecology of Labour and Civil Protection					
9	Tribotechnology					
10	Energy Supply and Transportation in the Agro-Industrial Complex					
11	Engineering Networks and Constructions in Agro-Industrial Complex					
12	The Theory of Agricultural Machines and Advanced Technologies in Agro-Industrial Complex					
13	The Theory of Tractors and Cars and the Automatic Control System of Braking and Dispersal of Wheeled Vehicles					
14	Estimation of Efficiency of Engineering Decisions					
15	Geographic Information Systems and Precision Farming System					
16	Quality Management					

17	Stock Market					
18	Biofuels: Efficiency of their Production and Consumption in the Ukrainian Agro-Industrial Complex					
19	Mechanized Technologies in Plant Growing					
20	Maintenance of Machines for Plant Growing					
21	Machine-Use in Plant Growing (Installation and Commissioning)					
22	Design of Technological Processes in Crop Production					
23	Technology of Maintenance of Machines					
24	Organization of Works for Maintenance Enterprises					
25	Technology of Repair of Cars					
26	Designing of Technological Processes of Technical Service					

2. Select the 10 disciplines that you think are most needed when studying in magistracy?

_____

_____

_____

3. Please indicate the names of the courses that you would consider expedient to include in the curriculum.

_____

_____

_____

_____

4. Indicate your level of satisfaction with studying at the engineering-technology faculty of SNAU on the following indicators. Give an estimate on a scale from 1 (insignificant level) to 5 (very high):

	1	2	3	4	5
1. Business reputation, image of the engineering-technology faculty					
2. Competitiveness of educational services					
3. Teaching staff					
4. Material and technical base					
5. Management system of the institution					
6. Internal infrastructure					
7. Quality of educational services (master's training)					
8. Scientific activity					
9. Training of scientific personnel					
10. Cooperation with public authorities					
11. Regional and international cooperation					
12. Content of the curriculum					
13. Using the latest, interactive teaching methods					

II block – questions of professional skills and abilities obtaining positively evaluated engineering-technology faculty's activity 96% of respondents

1. Evaluate professional skills of engineering-technology faculty graduates with five-point scale from 1 (low) to 5 (high):

	1	2	3	4	5
Level of general theoretical skills					
Level of basic (professional) knowledge and skills					
Strategic thinking					
Focus on the final results					
Ability to work in a team					
The ability to represent oneself and the results of work effectively					
Focus on career growth and professional development					
Skills in personnel management, teamwork					
Erudition, general culture, sociability					
Usage of information and communication technologies					
Maintaining business documentation					

2. Give your comment or wishes about the knowledge, skills and abilities that are provided during the preparing of masters at engineering-technology faculty of SNAU:

_____
_____
_____
_____

III block – open questions that revealed difficulties during the graduates' professional activities and suggestions on improving the professional training at the engineering-technology faculty of SNAU.

1. What, in your opinion, should be key point in preparing masters in engineering at engineering-technology faculty of SNAU:

a) convenient training schedule;
b) the opportunity to study free of charge (by public order);
c) professional teaching staff;
d) content of courses;
e) loyalty to magistrates.

2. Which of the following factors, in your opinion, has the greatest impact on the effectiveness of a professional's career and career development. Give an assessment on a five-point scale from 1 (low level) to 5 (high level).

	1	2	3	4	5
Level of general theoretical skills					
Level of basic (professional) knowledge and skills					
Strategic thinking					
Focus on the final results					
Ability to work in a team					
The ability to represent oneself and the results of work effectively					
Focus on career growth and professional development					
Skills in personnel management, teamwork					
Erudition, general culture, sociability					
. Usage of information and communication technologies					
. Maintaining business documentation					
Other (please specify):					

3. What would you like to improve on studying at the engineering-technology faculty of SNAU?

_____
_____
_____
_____

AppenixD

DATA

about compliance with licensing conditions in the field of higher education. Comparative table of observance of personnel and technological requirements concerning the material, technical, methodological and informational provision of educational activities in the field of higher education

Name of indicator (norm)	The value of the indicator (norm) for the third (educational-scientific) level of education	Actual value of the indicator	Deviation of the actual value of the indicator from the normative
1. General requirements			
1.1. Declared Licensed Volume (full-time education)	150	150	_
2. Personnel provision of educational activities in the field of higher education			
2.1. Availability of a unit of education or a department responsible for the training of higher education graduates in an educational institution	+	+	+
2.2. The presence of a department or department responsible for the training of applicants for higher education, a temporary working group (project team) from scientific and pedagogical workers, which is responsible for the training of applicants for higher education in a certain specialty	three persons having a degree and a scientific rank, of which at least two doctors of sciences	4 doctors of sciences, professors	+1 Doctors of Sciences, Professors
2.3. Presence of the head of the project group (the guarantor of the educational program): a degree and a scientific rank in the corresponding or related specialty; Experience of scientific-pedagogical and / or scientific work not less than 10 years (till September 6, 2019 for the initial level taking into account the experience of pedagogical work)	+	+	+
2.4. Conducting lectures on educational disciplines by scientific and pedagogical (scientific) workers of the corresponding specialty at the main place of work (the minimum percentage of the number of hours determined by the curriculum) of them:	+	+	+
who have a degree and / or a degree (before September 6, 2019, for the entry level, taking into account pedagogical staff having the highest category)	80	80	+
who have a PhD degree	50	50	+
2.5. Conducting lectures on educational disciplines that ensure the formation of professional competencies, scientific and pedagogical (scientific) employees, who are recognized professionals with experience in the profession (minimum percentage of the number of hours determined by the curriculum) of them:			

research, management, innovation or creative work in the specialty	50	50	+
2.6. Conducting lectures, practical classes, seminars and laboratory classes, conducting scientific guidance courseworks, diploma works (projects), dissertation researches by scientific and pedagogical (scientific) workers, the level of scientific and professional activity of which each is certified by the performance of the last five years at least three the conditions specified in paragraph 5 of the notes	For the last five years, at least three of the conditions specified in paragraph 5 of the notes	+	+
2.7. Availability of the graduation department for special (professional) training, which is headed by a specialist of the corresponding or related scientific and pedagogical specialty with a scientific degree of the doctor of sciences and a scientist degree	+	+	+
2.8. Availability of labour contracts (contracts) with all scientific and pedagogical workers and or orders for their recruitment	+	+	+
3. Material and technical provision of educational activities in the field of higher education			
3.1. Provision of premises for conducting training sessions and control activities (sq. Meters per person for the actual student contingent and the stated amount, taking into account the training for changes)	2,4	2,4	_
3.2. Provision of multimedia equipment for simultaneous use in classrooms (minimum percentage of audience)	30	30	-
3.3. The presence of social and domestic infrastructure including:			
libraries, including a reading room	+	+	+
medical point	+	+	+
3.4. Provision of higher education students with a hostel (minimum percentage of needs)	70	70	+
3.5. Availability of computer workstations, laboratories, landfills, equipment, equipment required for the implementation of curricula.	+	+	+
4. Educational and methodical provision of educational activities in the field of higher education			
4.1. Availability of a description of the educational program	+	+	+
4.2. Availability of a curriculum and an explanatory note to it	+	+	+
4.3. Availability of a work program for each curriculum	+	+	+
4.4. Availability of a complex of educational and methodological support for each curriculum	+	+	+
4.5. Availability of practical training program, practical work programs	+	+	+
4.6. Provision of students with study materials for each curriculum	+	+	+
4.7. Availability of methodical materials for certification of applicants	+	+	+