

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**  
**SHEI «PRYDNIPROVSKA STATE ACADEMY**  
**OF CIVIL ENGINEERING AND ARCHITECTURE»**

APPROVED by  
Academic Board of SHEI «Prydniprovsk  
State Academy of Civil Engineering and  
Architecture»  
protocol № 14 of 05, July, 2018

Head of Academic Board of SHEI PSACEA,  
rector

\_\_\_\_\_ V. I. Bolshakov

**EDUCATIONAL / SCIENTIFIC PROFESSIONAL PROGRAMME**

**« CIVIL ENGINEERING »**

SHE PSACEA 192m – 2018

KNOWLEDGE AREA	<b>191</b> Architecture and Engineering Development
SPECIALTY	<b>192</b> Engineering Development and Civil Engineering
ACADEMIC DEGREE	<b>second (Master's) degree</b>

**PREFACE**

ELABORATED by

PROJECT TEAM :

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PROJECT TEAM including :

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RESOLVED and APPROVED by

Academic Board of SHEI PSACEA protocol № 14 of 05, July, 2018

## I. INTRODUCTION

**Attestation** is the establishment of conformity of the acquired by higher education level applicants and the amount of knowledge, skills and other competences to the requirements of the educational program.

**The field of knowledge** is the main subject area of education and science that includes a group of related specialties for which vocational training is carried out.

### **Descriptors of the National Qualifications Framework**

- **Autonomy and Responsibility** - the ability to perform tasks independently, solve problems and be responsible for the results of its' activities;
- **Knowledge** - meaningful and assimilated scientific information, which is the basis of its conscious, purposeful activity.
- **Knowledge** is divided into empirical (factual) and theoretical (conceptual, methodological);
- **Communication** - the interconnection of subjects aimed to the information transfer, coordination of actions, joint activity;
- **Ability** - the ability to apply knowledge to accomplish tasks and solve problems.
- **Skills** are divided into cognitive (intellectual-creative) and practical (based on skill using methods, materials, instructions and tools).

**European Credit Transfer and Accumulation System (ECTS)** is a credit transfer and accumulation system used in the European Higher Education Area to provide, recognize, validate qualifications and educational components and promote the academic mobility of higher education applicants. The system is based on the determination of the academic load of the higher education applicant required to achieve the specific learning outcomes and is accounted for in ECTS credits.

**Qualification** - recognized by the authorized entity and certified by the relevant document standardized set of competencies acquired by the person (learning outcomes). Qualifications by volume are classified in full and partial, in content - educational and professional.

Qualification is considered to be complete if a person has acquired a complete list of competences at the appropriate level of the National Qualifications Framework, which is defined by the relevant standard.

Qualification is considered partial in case a person acquires part of the competences of the appropriate level of the National Qualifications Framework, which is defined by the relevant standard.

**Educational Qualification** is a recognized institution of higher education and certified by the relevant document on education the set of higher education standards established and the results of training (competences) obtained by the person.

**Professional Qualification** is recognized by the qualification center, the subject of educational activity (in particular, the institution of higher education), another authorized entity, and the standardized set of competencies (learning outcomes) attested by the person, allowing to perform a certain type of work or carry out a professional activity certified by the relevant document.

**Qualification Work** is a type of final certification that may be required at the final stage of obtaining a certain level of higher education in order to establish the conformity of the acquired learning outcomes (competencies) with the requirements of higher education standards. Forms of qualification work include (but are not limited to): diploma paper, dissertation research, public demonstration (defense), a set of scientific articles, a combination of different forms of the above, etc

**Qualification level** is a structural unit of the National Qualifications Framework that is defined by a set of competences that are typical of the qualifications at that level.

**Competence** is a dynamic combination of knowledge, skills, ways of thinking, attitudes, values and other personal qualities that determines a person's ability to successfully socialize, pursue a professional and / or further educational activity.

**Integral Competence** - a generalized description of a qualification level that expresses the basic competence characteristics of the level in terms of training and / or professional activity.

- **General competences** - universal competences that are independent of the subject area, but are still important for the successful further professional and social activities of the applicant in various fields and for his personal development.

-**Professional (specialty, subject) Competences** - competencies that depend on the subject area, and are important for successful professional activity in a particular specialty.

**The European Credit Transfer and Accumulation Credit (hereinafter referred to as ECTS Credit)** is the unit of measurement of the academic load of a higher education applicant required to achieve the defined (expected) learning outcomes. The volume of one ECTS loan is 30 hours. The load of one academic year per day of study is usually 60 ECTS credits.

**The National Qualifications Framework** is a systematic and structured description of qualifications levels.

**Educational (vocational, educational, scientific or educational-creative) program** - a system of educational components at the appropriate level of higher education within the specialty, which defines the requirements for the level of education of students who can start training under this program, the list of disciplines and logical sequence their study, the number of ECTS credits required to complete this program, and the expected learning outcomes (competences) that the applicant should have for an appropriate education degree.

**Learning Outcomes (programmatic)** - Knowledge, skills, attitudes, values and other personal qualities acquired through learning and development that can be identified, planned, evaluated, and measured and that a person is able to demonstrate after completing an educational program or individual educational components.

**Specialization** - a component of the specialty, which is determined by the institution of higher education and provides a specialized educational program for the preparation of applicants for higher and postgraduate education.

Quality of higher education - compliance of the learning outcomes with the requirements established by law, the relevant higher education standard and / or the agreement on the provision of educational services.

## I. INTRODUCTION

Educational and professional program is used during:

- licensing of specialty and accreditation of educational and professional program;
- preparation of curricula and working curricula;
- formation of work programs of educational disciplines, practices, individual tasks;
- formation of individual curricula of students;
- development of diagnostic tools for higher education quality;
- certification of higher education applicants;
- determining the content of training in the retraining and advanced training system;
- professional orientation of applicants for the profession;
- external quality control of training of specialists;

Users of educational and professional program:

- Higher education students attending the academy;
- scientific and pedagogical staff providing training in the specialty 192 "Engineering Development and Civil Engineering"
- Examination Committee on specialty 192 "Engineering Development and Civil Engineering";
- the Academy's Admission Committee.

The educational and professional program extends to the departments of the Academy, that take part in the training of specialists of the Master's degree by the specialty 192 "Engineering Development and Civil Engineering".

### **Designations used in the professional education program**

NQF - National Qualifications Framework;

GC - general competencies;

PC - professional competencies;

GLO - general learning outcomes;

PCS - professional competencies by specialty;

PLO - professional learning outcomes;

DGTC- disciplines of the general training cycle;

EC - elective courses;

TP - term project;

TW - term work.

НРК – Національна рамка кваліфікацій;

ЗК – загальні компетентності;

ФК – фахові компетенції;

ЗР – загальні результати навчання;

ПК – професійні компетентності за спеціальністю;

ПР – професійні результати навчання;

ЗД– дисципліни загального циклу підготовки;

ВД – варіативні дисципліни;

КП – курсовий проект;

КР – курсова робота.

## II. GENERAL INFORMATION

<b>Official Name of Educational and Professional Programme</b>	Civil Engineering192msn – 2018
<b>Higher Educational Level</b>	Second
<b>Academic Degree</b>	Master
<b>Knowledge Area</b>	19 «Architecture and Engineering Development »
<b>Specialty</b>	19 «Architecture and Engineering Development » 192 «Engineering Development and Civil
<b>Specialization</b>	Civil Engineering
<b>Academic Accreditation</b>	Information about the accreditation of the educational program begins
<b>Educational qualification</b>	Master (MSc )in Engineering Construction and Civil Engineering
<b>Educational qualification</b>	214.2 Civil Engineer 2359.1 2359.1 Researcher 2310.2 Lecturer of a HEI
<b>Diploma type</b>	Single, joint, dual degree,
<b>Course duration</b>	1,9 years
<b>Total credit ECTS</b>	Educational and scientific120 credits ECTS
<b>Term/ Level</b>	QF for EHEA – 2nd level, EQF for LLL – 7 level; HPK Ukraine– 8 level
<b>Prerequisites</b>	Requirements for previous higher education

### THE PURPOSE OF THE PROGRAM

-is to provide on the basis of a bachelor's degree, training of professional personnel in the field of civil engineering by acquiring them the sufficient competences for the research, so results of which, have theoretical and practical importance, as well as their support during the preparation and defense of the master's thesis.

### III. CHARACTERISTICS OF THE EDUCATIONAL AND PROFESSIONAL PROGRAM

<b>Description of the subject area</b>	<p><b>The subject of study</b> is organizational, managerial, economic, control-analytical, consulting, expert activity of economic entities and public sector institutions, research and pedagogical activity in the field of civil engineering.</p> <p><b>Aims of the training:</b> integration of general technical and special technical training for professional activity in the field of construction, production-technical, design, operational services of construction enterprises, in design, research institutions, educational establishments.</p> <p><b>The theoretical content of the subject area</b> is an in-depth study of the achievements of world science, practice, culture and professional ethics, the latest technologies in the field of civil engineering; modern research methodology and pedagogical activity for the study of construction processes, problems in the process of design and implementation of construction projects.</p> <p><b>Methods, techniques and technologies:</b> dialectical method of knowledge of social phenomena; logical, comparative, systemic, structural, functional and integrated approaches; general scientific and special methods of analysis, synthesis, mathematical modeling and prediction of construction processes, methods and technologies of construction project management.</p> <p><b>Tools and equipment:</b> Higher education applicant must possess information, communication and educational technologies in the field of civil engineering and engineering development; progressive information systems and technologies for the organization of construction processes, a set of methods for managing the activities of construction organizations, as well as methodological tools for the calculation and modeling of building structures.</p>
<b>Program Focus</b>	<p><b>General:</b> Emphasis on the ability to perform theoretical and design-experimental works, solving the problems of the civil engineering - the tasks of strength, durability, reliability and safety of structures, buildings and constructions; the use of information technology, advanced computer mathematics systems, high-tech computer technologies, computer-aided design software, computer-aided design, software engineering and computer engineering; project management; organization of work of design and production units engaged in the development and design of buildings, structures and their constructive elements and technologies.</p>
<b>Orientation of the program</b>	<p>Scientific and theoretical principles for the improvement of practical activity in the field of civil engineering.</p>

<p><b>Employment of graduates (except for a Ph.D.)</b></p>	<p>Scientific and teaching activities in the field of civil engineering and engineering development.  Scientific, administrative and management activity in educational establishments, institutions of state, territorial-administrative systems and construction sector.</p> <p><b>Posts by occupational classifier DC003: 2010</b></p> <p><b>1. Managers:</b></p> <p><b>1223 Heads of production departments in civil engineering</b></p> <p>    <b>1223.1 Chief Technician - Heads of production departments in civil engineering</b></p> <p>        <b>21015 Chief Civil Engineer</b></p> <p>        <b>20735 Chief Engineer</b></p> <p>        <b>21480 Director of Capital Construction</b></p> <p>    <b>1223.2 Heads (other managers) and Chiefs of production departments in civil engineering</b></p> <p><b>24441 Contractor</b></p> <p>    <b>23419 Construction and Mechanical Foreman</b></p> <p>    <b>23898 Chief of Department</b></p> <p>    <b>24116 Head of Housing and Utility Services (HUS)</b></p> <p>    <b>24097 Section Foremaster</b></p> <p><b>1238 Job Captain /Project Manager and Program Head Manager</b></p> <p><b>1313 Small Business Managers Without Management Apparatus in Construction</b></p> <p><b>144 Managers(executives) in construction, transport, post and communications</b></p> <p><b>Managers (executives) of architecture and construction, technical control, analysis and advertising</b></p> <p><b>2 Skilled Specialists</b></p> <p><b>2142 Specialists in Civil Engineering</b></p> <p>    <b>2142.1 Researchers (CE)</b></p> <p>        <b>Junior Researcher (CE)</b></p> <p>        <b>Research Associate (CE)</b></p> <p>    <b>2142.2 Engineers</b></p> <p><b>22395 Design and estimate engineer</b></p> <p>    <b>22177 Civil Engineer</b></p> <p>        <b>Structural Engineer</b></p> <p>        <b>Technical Supervision Engineer</b></p> <p>        <b>Building Expert</b></p> <p><b>Structural Engineer for the Restoration of Architectural Monuments and Town Planning</b></p> <p><b>2310.1 Professors and Associate Professors</b></p> <p><b>2310.2 Other teachers of universities and higher education institutions</b></p> <p>    <b>Job Placement.</b> Organizations involved in the design, construction, operation of buildings and structures; enterprises engaged in development and production of building materials, products and structures; public authorities and local self-government bodies; enterprises of housing and communal services; research institutes and laboratories; specialized chairs of educational institutions</p>
<p><b>Program Details</b></p>	<p>Advanced preparation for the block of elective training courses</p>



#### IV. LIST OF GRADUATE'S COMPETENCES

<b>Integral Competences</b>	<p>Ability to solve complex engineering and research problems during professional activities in the field of construction and architecture, which implies the ability to perform technical and economic comparison of variants, the use of modern methods of field research, the use of new building materials and energy-saving technologies.</p>
<b>General competences</b>	<p><b>GC1.</b> Ability to communicate in written and oral communication in Ukrainian and English (or other) languages.</p> <p><b>GC2.</b> The ability to learn, to acquire knowledge in the subject area and to integrate them with the existing ones.</p> <p><b>GC3</b> Ability to be critical and self-critical in understanding the factors that have a positive or negative impact on communication, and the ability to identify and consider these factors in specific communication situations.</p> <p><b>GC4.</b> Ability to produce new ideas, show creativity, ability to think systematically.</p> <p><b>GC5.</b> Ability to search and analyze information from different sources.</p> <p><b>GC6.</b> Orientation to safety</p> <p><b>GC7.</b> Acquisition of a flexible way of thinking that enables to understand and solve problems and tasks, while maintaining critical attitude to established scientific concepts.</p> <p><b>GC8.</b> Ability to solve tasks and make appropriate informed decisions</p> <p><b>GC9.</b> Ability to conduct research at the appropriate level, have research skills that are able to form (making presentations or presenting reports) new products in the chosen field, choose the right directions and appropriate methods for their implementation, taking into account available resources</p> <p><b>GC10.</b> Ability to work independently and in a team, ability to communicate with colleagues in the field of scientific achievements, both at the general level and at the level of specialists</p> <p><b>GC11.</b> Knowledge and understanding of the subject area and understanding of the specialty</p> <p><b>GC12.</b> Ability to think abstractly, the ability to analyze and synthesize, which allows to formulate conclusions (diagnosis) for different types of complex management tasks, to plan, analyze, control and evaluate their own work and the work of others.</p> <p><b>GC13.</b> Entrepreneurial spirit, initiative through the ability to effectively use different theories in science management and business administration</p> <p><b>GC14.</b> Have the skills of project development and management to ensure a high level of efficiency of implementation of different types of projects in the subject area.</p> <p><b>GC15.</b> Skills of using information and communication technologies, implementation of computer programs and use of existing ones.</p>

	<b>GC16.</b> Focusing on environmental conservation.
<b>Professional (specialty, subject) Competences</b>	<p><b>PC1.</b>Basic knowledge of fundamental sciences, to the extent necessary for the development of general professional disciplines.</p> <p><b>PC2.</b> Basic knowledge in the field of construction and architecture, necessary for the development of professionally oriented disciplines.</p> <p><b>PC 3.</b> Basic knowledge of scientific concepts, theories and methods necessary to understand the principles of construction structures.</p> <p><b>PC 4.</b> Basic knowledge of basic legal acts and reference materials, current standards and specifications, instructions, European standards and other regulatory documents in the field of construction and architecture.</p> <p><b>PC 5.</b>Ability to compile, draw up and operate technical documentation when solving specific engineering tasks in the specialty 192 "Civil Engineering".</p> <p><b>PC 6.</b>Knowledge of the basics of occupational safety, industrial sanitation and fire safety in the organization of work.</p> <p><b>PC 7.</b>Ability to evaluate the technical and economic indicators of the project taking into account the influence of organizational and technological factors.</p> <p><b>PC 8.</b> Ability to understand and take into account the social, environmental, ethical, economic aspects that influence on the formation of current and future decisions.</p> <p><b>PC 9.</b>The ability to calculate structures of buildings and structures for extreme actions, the choice of effective materials and design solutions in their design.</p> <p><b>PC 10.</b> Ability to apply professional-profiled knowledge and practical skills to accomplish typical specialty tasks.</p> <p><b>PC 11.</b> Ability to identify, classify and describe works related to the design, installation and operation of buildings and structures by the use of analytical and modeling techniques.</p> <p><b>PC 12.</b> Ability to conduct business communications, knowledge and understanding of the subject area and understanding of the specialty to determine the structure of knowledge in the specialty.</p> <p><b>PC 13.</b> Ability to perform calculations of reinforced structural elements of buildings and structures, taking into account the actual work of structures, properties of materials, design scheme.</p> <p><b>PC 14.</b> Ability to create products on a specialty, taking into account all aspects of the task, including creation, promotion, implementation and improvement.</p> <p><b>PC 15.</b> Ability to independently substantiate and choose technological solutions in construction, using modern methods of technology and work organization.</p> <p><b>PC 16.</b>Ability to analyze the current state and trends of effective construction development.</p> <p><b>PC 17.</b>Ability to organize the processes of construction and reconstruction of objects of civilian and industrial purpose in the conditions of compacted urban development and operating</p>

	<p>enterprises.</p> <p><b>PC 18.</b> Ability to use modern methods of calculating building structures and numerical methods for solving applied problems of structural mechanics.</p> <p><b>PC 19.</b> The use of optimization methods in solving engineering, organizational and technological problems in construction. Ability to compose mathematical models of application problems, calculation schemes and solve them using analytical and numerical methods.</p> <p><b>PC 20.</b> Choosing rational solutions for technology and organization of reconstruction and repair works of engineering networks and structures.</p> <p><b>PC 21.</b> Use of computer aided design systems in civil engineering and construction.</p> <p><b>PC 22.</b> Competence in technical diagnostics, design and reinforcement of buildings and structures.</p>
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#### **V. LEARNING OUTCOMES (PROGRAMMATIC)**

<p><b>Learning Outcomes (Programmatic)</b></p>	<ol style="list-style-type: none"> <li>1. Possession of sufficient knowledge in the fields related to the disciplines of the specialty, which will allow to critically analyze the situation and identify key trends in the development of the industry.</li> <li>2. Acquiring knowledge for organizing communication interaction and solving conflict situations in the process of forming and implementing services in the design, installation and operation of buildings and structures, using modern information, communication and innovation technologies.</li> <li>3. Understanding tools and strategies relevant to diagnosing and analyzing the state of development of services in the design, installation and operation of buildings and structures at a level that will allow specialty employment, the ability to effectively use theoretical knowledge in the design and implementation of services in the design, installation and operation of buildings and structures.</li> <li>4. Knowledge and understanding of the scientific principles behind construction, the use of new approaches to the calculation and design of structures, non-traditional and secondary materials, technologies.</li> <li>5. Knowledge of the bases of professionally oriented disciplines of specialty: engineering networks and structures, research in construction, professional and civil security, intellectual property, foreign language by professional direction, economic evaluation of innovative technologies and design solutions in construction, economics and enterprise management.</li> <li>6. Broadening the knowledge: design of metal structures, design of concrete and stone structures, design of foundations and foundations, design of wooden structures, design in seismic areas, development of technologies of erection of buildings and structures.</li> <li>7. Knowledge and skills in development and implementation</li> </ol>
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of new innovative products.

8. Knowledge and understanding of methodologies for designing and upgrading facilities in accordance with the regulatory requirements of applicable standards and specifications.

9. Knowledge of modern achievements of innovative technologies in the field of services in the design, installation and operation of buildings and structures.

10. Understanding the impact of technological advances in social, economic, social and environmental contexts.

11. Gaining adequate knowledge and understanding relevant to the specialty of which the scale will be sufficient to successfully organize and conduct research in the field of services in the design, installation and operation of buildings and structures, to form and represent the results of professional activity.

12. The theory and methodology of optimal projection at the level of construction of mathematical model of engineering problem.

13. The theory and methodology of formation of calculation schemes at the level of construction of mathematical model of engineering problem using equations of mathematical physics, choice of methods of their solving, knowledge of the basis of statistical methods of processing of results of researches of their solving using analytical and numerical methods.

14. Regulatory, technical and reference literature in the field of modernization, reconstruction and execution of repair and restoration works; stages and methods of technical inspection of buildings and structures; principles of modernization buildings; types of reconstruction of buildings and structures; methods of reinforcement, repair and replacement of building structures in the reconstruction of buildings; the process of designing the reconstruction; execution of construction works during reconstruction.

15. Principles of organization of repair and restoration works. Principles of energy audit in the construction industry and the program of energy certification and certification of buildings.

16. Tasks and prospects of construction business in the field of reconstruction and strengthening of structural elements of buildings and structures, the influence of external factors and conditions of operation on the work of the structure.

17. Causes of physical and moral deterioration of structures of buildings and structures, advantages and disadvantages of building materials in relation to the reconstruction and strengthening of building structures, types of loads and their connection.

18. Methods of calculation of buildings constructed under seismic conditions, taking into account the influence of soil conditions and peculiarities of their application, design requirements for buildings constructed under seismicity conditions.

19. Seismic monitoring of construction objects, design of seismic isolation systems for buildings.
20. Influence of new construction and reconstruction on existing buildings and structures, possibility of change of physical and mechanical properties of soils, reduction of their bearing capacity and natural soil resistance, activation of dangerous geological processes.
21. Instrumental diagnostics of buildings for determination of zones of subsidence, subsidence or disturbance of stability: geodetic leveling of surfaces; observation of sedimentation; observation and measurement of rolls (slopes) of structures.
22. Soil properties and their characteristics, which are used in soil models implemented in geotechnical software complexes, basic stages of pre-processor preparation of geotechnical problems solving and post-processing work
23. Experimental and theoretical approaches to conducting engineering and geodetic surveys of the state of structures and detection of deviations of foundations and the surrounding soil mass of NPP buildings from design data, factors and parameters that affect the settlement of buildings and structures.
24. Apply knowledge and understanding to identify, formulate and solve construction problems using known methods.
25. Apply knowledge to solve the characteristic problems of synthesis and analysis in the study of building structures.
26. Systematically think and apply creative abilities to the formation of fundamentally new ideas in the field of services in the design, installation and operation of buildings and structures.
27. Apply knowledge of technical characteristics, technological features of product formation and realization in the specialty.
28. Calculate, design, research market trends, conduct marketing analysis, bring to market new products in construction.
29. To search information in various sources to solve problems in the field of services in the design, installation and operation of buildings and structures. Work effectively both individually and as part of a team.
30. Identify, classify and describe work in the field of services in the design, installation and operation of buildings and structures
31. Combine theory and practice, as well as make decisions and develop an activity strategy to meet industry goals, taking into account human values, public, state and production interests.
32. Perform relevant research and apply research skills in the design, installation and operation of buildings and structures.
33. Critically evaluate the results of the activities and justify the decisions made.
34. To apply in practice knowledge, to apply methodological tools of cognition in the field of services in the design, installation and operation of buildings and structures, to analyze the results of research in the context of existing theories, to draw appropriate conclusions.

35. Develop a mathematical model of the problem, choose the objective function and constraints on the model parameters, apply basic analytical optimization methods to solve engineering problems, apply basic methods of numerical analysis of problems to find unconditional and conditional extrema for the objective function of many variables.

36. Perform diagnostics and assessment of the condition of the building structures of the reconstructed buildings and structures; to carry out design and organization of reconstruction of buildings and structures.

37. Determine the list of necessary repair and rehabilitation work in the aftermath of the consequences of accidents and catastrophes; to carry out preparatory measures for carrying out repair and restoration works in the course of elimination of consequences of accidents and catastrophes; organize the implementation of repair and rehabilitation works in the event of the consequences of accidents and catastrophes; to determine the measures for occupational safety while performing repair and restoration works.

38. Determine the degree of provision of energy performance of the building in accordance with the basic requirements and minimum indicators, determine the basic energy performance of the building.

39. Calculate the needs of the building for heating, cooling and hot water supply through the outer shell of the building.

40. Perform calculations taking into account the actual work of structures, materials properties, design scheme.

41. It is rational to design reinforcement of building structures, to choose the right ways of reinforcement of building structures, to identify the possibilities and ways of saving material in structures.

42. To determine and analyze the level of seismic hazard taking into account the ground conditions of the site; determine the necessary combination of loads when designing buildings, determine the optimal method of calculation, depending on the type of building.

43. To calculate elements of structures taking into account the peculiarities of their work during seismic impacts, assign optimal design solutions depending on the peculiarities of buildings and spores, perform design of elements taking into account their peculiarities.

44. Schematize geological sections and simplify them to the needs of specific programs, rationally choose a calculation scheme, build a model of soil environment and work with finite elements (correctly evaluate the properties of soils when choosing a model of soil environment and enter the initial data) .

45. Ability to communicate, including oral and written communication in Ukrainian and foreign languages (English, German, French).

46. Ability to use a variety of methods, including modern information technology, for effective communication at the

	<p>professional and social levels.</p> <p>47. Ability to adapt to new situations and make appropriate decisions.</p> <p>48. Ability to be aware of the need for lifelong learning in order to deepen acquired and acquire new professional knowledge.</p> <p>49. A ability to be responsible for the work being performed, to make decisions independently, to achieve the set goal in compliance with the requirements of professional ethics.</p> <p>50. Ability to demonstrate an understanding of basic environmental principles, occupational safety and health.</p>
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## VI. FORMS OF ATTESTATION OF APPLICANTS FOR HIGHER EDUCATION

<b>Forms of Attestation of Applicants for Higher Education</b>	Certification in the specialty is carried out in the form of public defense of qualification work in the specialty.
<b>Requirements for Qualification Work / Project</b>	<p>Qualification work is a student's scientific and practical work, which is performed at the final stage of obtaining a Master's degree in civil engineering and engineering development in order to establish the conformity of higher education results (competencies) with the requirements of higher education standards. It is a qualification document, on the basis of which the EB determines the level of theoretical training of the graduate, his willingness to work independently in a specialty and makes the decision on the assignment of the relevant qualification and the award of a diploma.</p> <p>Scientific information in the work should be presented in the most complete form, necessarily disclosing the course and results of the study with a detailed description of the research methodology. The completeness of scientific information should be reflected in detailed factual material with justifications, hypotheses and theoretical generalizations. The work materials should contain specific, well-defined recommendations aimed at improving the object of study. The presentation of the material is subject to one major idea, defined clearly by the author.</p>
<b>Requirements for Qualification Work / Project Defense (presentations in the presence)</b>	<p>The qualification work is performed in the form of a student's report in the presence of members of the Examination Board.</p> <p>The report should be accompanied by a demonstration of the graphic part in the form of a presentation with handouts or in the form of graphic drawings, posters.</p> <p>Master's Degree Defence is held at open examination board meetings. The order of the examination board and the schedule of protection is approved by the order of the academy and communicated in advance to the students.</p> <p>The consent to the admission to protection must be signed by the Head, the Controller and the Joint Consultants (if</p>

any), and then signed by the Head of the department. On the day of defence, the student must hand over to the responsible secretary of the examination board the following materials: explanatory note; submission and review; record book; electronic CD or graphic drawings. The materials must be submitted half an hour before the examination board begins.

The duration of defence is usually set to 30 minutes. The duration of the student's report is 8-10 minutes. In the course of the report, the student should use a developed presentation containing illustrative materials to demonstrate the main points of his work.

The report includes the formulation of conclusions where the student should define clearly the main results of the work, make comparisons with well-known analogues, and tell about the prospects of further developments in this direction and practical application of the results.

After the report, a review of the qualification work will be read. Then the student responds to the reviewer's comments.

Then, the student answers the questions of the members of the Examination Committee who are asked to determine the level of his professional training and erudition as a whole. Questions are asked orally and entered into the minutes of the meeting.

The student must give a reasoned detailed answer to all questions. After the public defence of the qualification work, the results of the defence are discussed at a closed meeting of the Examination Board and decisions are made on the evaluation of the work. Evaluating a student's report, first of all, draws attention to how freely and confidently the speaker has the material of his work, modern terminology, whether he can report without the help of the text of the report. It is important that the speaker can explain confidently and easily the materials of tables, graphs, figures, diagrams, drawings.



## VII. REQUIREMENTS FOR HAVING AN INTERNAL QUALITY ASSURANCE SYSTEM FOR HIGHER EDUCATION.

<b>Principles and Procedures for Quality of Education</b>	-are governed by the following: 1. Standard PSACEA AR(Academic Regulation)-01-15 "Regulations of Educational Process Organisation". 2. Standard PSACEA AR-03-17 "Regulations of organization of practical student's training".
<b>Monitoring and Periodic Review of Programs</b>	-are governed by the following: Standard PSACEA "Regulations of Educational Process Organisation".
<b>Evaluation of Applicants for Higher Education</b>	Assessment of the results of the students of the Academy is carried out by methods that correspond to the specifics of a particular discipline. Student achievement is monitored using a 100-point grading system, with mandatory grading and national ECTS.
<b>Improvement of Qualification of Scientific-Pedagogical, Pedagogical and Scientific Workers</b>	-are defined by the Regulation "On development of professional competence and internship of pedagogical and scientific-pedagogical employees of higher educational establishments, approved by the order of the Ministry of Education and Science, Youth and Sports" Ukraine dated 24.01.2013 №48
<b>Availability of Necessary Resources for Educational Process Organizing</b>	- is determined by the requirements for material and technical support (library with modern educational literature, scientific, reference and professional periodicals, technical means of training, availability of bases for conducting all kinds of practice) and other resources (work curriculum; work curricula of disciplines and practices; educational disciplines)).
<b>Availability of Information Systems for Efficient Educational Process Management</b>	-are governed by the Standard PSACEA AR(Academic Regulation)-01-15 "Regulations of Educational Process Organisation".
<b>Publicity of Information on Educational Programs, Degrees of Higher Education and Qualification</b>	The publicity of information on educational programs, degrees of higher education and qualification is available on the site of the State Higher Educational Institution "Pridneprovsk State Academy of Civil Engineering and Architecture" <a href="http://pgasa.dp.ua">pgasa.dp.ua</a> in open access.
<b>Adherence to Academic Integrity by Academy Staff and Higher Education Applicants</b>	Assessment of students' knowledge is carried out according to educational methodological complexes under each discipline
<b>Academic Plagiarism Prevention and Detection System</b>	Plagiarism is checked. <a href="http://www.plagtracker.com/">http://www.plagtracker.com/</a> <a href="http://www.scanmyessay.com/">http://www.scanmyessay.com/</a> <a href="http://plagiarismdetector.net/">http://plagiarismdetector.net/</a> <a href="http://www.duplichecker.com/">http://www.duplichecker.com/</a> <a href="http://www.hfhtrater.com/">http://www.hfhtrater.com/</a>

## VII. LIST OF THE COMPONENTS OF EDUCATIONAL AND PROFESSIONAL PROGRAMME AND THEIR CONSECUTION

### 8.1. List of Components

№ i/o	Components of educational and professional programme (disciplines, practical trainings, assessment)	ECTS credits	Summative assessment	Comptence code
<b>1. Compulsory Subjects</b>				
<b>01</b>	<b>Mathematical Research Methods in Building Industry</b>	<b>3</b>	<b>Credit</b>	<b>GC</b>
<b>02</b>	<b>Tertiary Education</b>	<b>3</b>	<b>Credit</b>	<b>GC</b>
<b>1.1. Elective training cycle</b>				
<b>1</b>	<b>Scientific Foreign Language (English, French, German)</b>	<b>3</b>	<b>ЭКЗАМЕН</b>	<b>GC</b>
<b>2</b>	<b>European standards, Energy Audit, Intellectual Property</b>	<b>3</b>	<b>Credit</b>	<b>GC</b>
<b>2. Professional Training Cycle</b>				
<b>2.1. General training cycle</b>				
<b>1.</b>	<b>Professional and Civil Safety</b>	<b>3</b>	<b>Examination Credit</b>	<b>PC</b>
<b>2.</b>	<b>Construction of Buildings and Structures</b>	<b>5</b>	<b>Examination</b>	<b>PC</b>
<b>3.</b>	<b>Systems of Computer Aided Construction Design of Structures and Buildings</b>	<b>3</b>	<b>Credit</b>	<b>PC</b>
<b>4.</b>	<b>Organizational and Technological Reliability in Engineering Development</b>	<b>4</b>	<b>Credit</b>	<b>PC</b>
<b>5.</b>	<b>Geotechnical Design in Engineering Development</b>	<b>4</b>	<b>Examination</b>	<b>PC</b>
<b>6.</b>	<b>Development in Building Industry and Project Management in Engineering Development</b>	<b>3</b>	<b>Credit</b>	<b>PC</b>
<b>7.</b>	<b>Calculation of Buildings and Structures under the Influence of Dynamic Loads and Impact</b>	<b>3</b>	<b>Credit</b>	<b>PC</b>
<b>8.</b>	<b>Modernization, Reconstruction, Repair and Restoration Work in Civil Engineering and Engineering Development</b>	<b>4,5</b>	<b>Examination</b>	<b>PC</b>
<b>9.</b>	<b>Logistics in Engineering Development</b>	<b>3</b>	<b>Examination</b>	<b>PC</b>
<b>10.</b>	<b>Numerical Methods in Engineering Calculations</b>	<b>3</b>	<b>Credit</b>	<b>PC</b>
<b>11.</b>	<b>Rise of Manufacturability Level of Buildings</b>	<b>3</b>	<b>Examination</b>	<b>PC</b>

12.	<b>Rational Design of Reinforced Concrete and Masonry Structures and buildings</b>	<b>17,5</b>	<b>Examination Examination Credit</b>	PC
13.	<b>Diagnostics and Reinforcement of Reinforced Concrete and Masonry Structures</b>	<b>3</b>	<b>Examination</b>	PC
14.	<b>Peculiarities of Design of Buildings and Structures in Seismic Conditions</b>	<b>3,5</b>	<b>Examination</b>	PC
15.	<b>Computer Simulation of Buildings and Structures Made of Reinforced Concrete Structures</b>	<b>3,5</b>	<b>Examination</b>	PC
16.	<b>Design of Metal Structures of Buildings and Structures of Improved Risk</b>	<b>17,5</b>	<b>Examination Examination Credit</b>	PC
17.	<b>Technical Diagnostics and Reinforcement of Metal Constructions of Buildings and Structures.</b>	<b>3</b>	<b>Examination</b>	PC
18.	<b>Manufacturing Methods of Metal Structures</b>	<b>3,5</b>	<b>Examination</b>	PC
19.	<b>Computer Simulation of Metal Constructions of Buildings and Structures</b>	<b>3,5</b>	<b>Examination</b>	PC
20.	<b>Peculiarities of Design of Bases and Foundations in Difficult Geological and Hydrogeological Conditions</b>	<b>17.5</b>	<b>Examination Examination Credit</b>	PC
21.	<b>Modeling of Interaction of the Bases with the Soil Environment</b>	<b>3</b>	<b>Examination</b>	PC
22.	<b>Monitoring of Condition of Foundations and Bases of Construction Project</b>	<b>3.5</b>	<b>Examination</b>	PC
23.	<b>Engineering Protection and Ground Preparation</b>	<b>3.5</b>	<b>Examination</b>	PC
24.	<b>Latest Technologies of Construction Engineering</b>	<b>17.5</b>	<b>Examination Examination Credit</b>	PC
25.	<b>Cost-Effective Process of Construction and Buildings &amp; Structures Erection</b>	<b>3</b>	<b>Examination</b>	PC
26.	<b>Construction Technology for Multiuse Buildings</b>	<b>3.5</b>	<b>Examination</b>	PC
27.	<b>Energy efficient and environmentally friendly technologies in construction</b>	<b>3.5</b>	<b>Examination</b>	PC
28.	<b>Construction of High-Rise Buildings and Structures in Dense Housing</b>	<b>17.5</b>	<b>Examination Examination Credit</b>	PC

<b>29.</b>	<b>Rationale for Effective Decision Making in Civil Engineering and Engineering Development</b>	<b>3</b>	<b>Examination</b>	<b>PC</b>
<b>30.</b>	<b>Organization of Building Production During the Reconstruction of Existing Enterprises</b>	<b>3.5</b>	<b>Examination</b>	<b>PC</b>
<b>31.</b>	<b>Organization of Reconstruction and Restoration of Engineering Networks and Structures</b>	<b>3.5</b>	<b>Examination</b>	<b>PC</b>
<b>Set №6</b>				
<b>6.01</b>	<b>Formation of Design Schemes of Architectural-Compositional and Structural Solutions</b>	<b>17.5</b>	<b>Examination Examination Credit</b>	<b>PC</b>
<b>6.02</b>	<b>Optimization Algorithms and Optimization Methods</b>	<b>3</b>	<b>Examination</b>	<b>PC</b>
<b>6.03</b>	<b>Theory of Plate and Shell</b>	<b>3.5</b>	<b>Examination</b>	<b>PC</b>
<b>6.04</b>	<b>Theory of Stability and Oscillation of Structures</b>	<b>3.5</b>	<b>Examination</b>	<b>PC</b>
<b>Set №7 (Architecture)</b>				
<b>7.01</b>	<b>Scientific and Practical Ways of Formation of Urban Development, Design, Calculation and Erection of Buildings and Structures Taking into Account Architectural and Planning, Structural-Technical and Sanitary-Hygienic Factors</b>	<b>17.5</b>	<b>Examination Examination Credit</b>	<b>PC</b>
<b>7.02</b>	<b>Town-Planning Bases for Reconstruction and Erection of Modern City Buildings and Structures</b>	<b>3</b>	<b>Examination</b>	<b>PC</b>
<b>7.03</b>	<b>The Current System of Regulation of Design and Construction in Ukraine, Computer Methods of Forming Urban Development, Buildings and Buildings, Their Structures</b>	<b>3.5</b>	<b>Examination</b>	<b>PC</b>
<b>7.04</b>	<b>Modern Means of Assessment and Analysis, and Basic Regulations for the Substantiation of Functional, Three-Dimensional and Structural Decisions of Buildings and Structures, Their Separate Structural Elements</b>	<b>3.5</b>	<b>Examination</b>	<b>PC</b>
<b>Other Types of Training</b>				
Пр.1	<b>Production Training</b>	<b>6</b>	<b>Credit</b>	<b>PC</b>
Пр.2	<b>Scientific -Research Training</b>	<b>6</b>	<b>Credit</b>	<b>PC</b>
МДР	<b>Implementation and Presentation</b>	<b>29,5</b>	<b>public</b>	<b>GC, PC</b>

	<b>of Master's Thesis</b>		<b>defense</b>	
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## LIST OF REGULATORY DOCUMENTS

### A). Official documentation:

1. ESG – [http://ihed.org.ua/images/pdf/standards-and-guidelines\\_for\\_qa\\_in\\_the\\_ehea\\_2015.pdf](http://ihed.org.ua/images/pdf/standards-and-guidelines_for_qa_in_the_ehea_2015.pdf).
2. ISCED (MCKO) 2011 – <http://www.uis.unesco.org/education/documents/isced-2011-en.pdf>.
3. ISCED-F (MCKO-Г) 2013 – <http://www.uis.unesco.org/Education/Documents/isced-fields-of-education-training-2013.pdf>.
4. Law on Higher Education- <http://zakon4.rada.gov.ua/laws/show/1556-18>.
5. Law on Education- <http://zakon5.rada.gov.ua/laws/show/2145-19>.
6. Order of the Ministry of Education and Science of Ukraine of December 21, 2017 No. 1648 “On Amendments to the Order of the Ministry of Education and Science of Ukraine of 01.06.2017 No. 600.
7. National Classifier of Ukraine: "Classifier of Professions" ДК 003:2010.– К. : Видавництво «Соцінформ», 2010.
8. National Qualifications Framework – <http://zakon4.rada.gov.ua/laws/show/1341-2011-п>.
9. List of branches of knowledge and specialties <http://zakon4.rada.gov.ua/laws/show/266-2015-п>.
10. Letter from the Ministry of Education and Science of Ukraine from від 28.04.2017 № 1/9-239 .

### B) Useful links:

10. TUNING(to get acquainted with special (professional) competencies and examples of standards)– <http://www.unideusto.org/tuningeu/>.
11. National Glossary 2014 – [http://ihed.org.ua/images/biblioteka/glossariy\\_Visha\\_osvita\\_2014\\_tempus-office.pdf](http://ihed.org.ua/images/biblioteka/glossariy_Visha_osvita_2014_tempus-office.pdf).
12. Rashkevich Yu.M. The Bologna Process and the New Higher Education Paradigm – <file:///D:/Users/Dell/Downloads/BolonskyiProcessNewParadigmHE.pdf>.
13. Development of the quality assurance system of higher education in Ukraine: information and analytical review – [http://ihed.org.ua/images/biblioteka/Rozvitok\\_sisitemi\\_zabesp\\_yakosti\\_VO\\_UA\\_2015.pdf](http://ihed.org.ua/images/biblioteka/Rozvitok_sisitemi_zabesp_yakosti_VO_UA_2015.pdf).
14. Development of educational programs: guideline – [http://ihed.org.ua/images/biblioteka/rozroblennya\\_osv\\_program\\_2014\\_tempus-office.pdf](http://ihed.org.ua/images/biblioteka/rozroblennya_osv_program_2014_tempus-office.pdf).

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