



# PRE-DIPLOMA PRACTICE

## Syllabus

### Details of the academic discipline

Level of higher education	<i>First (bachelor's)</i>
Field of Study	<i>12 Information technologies</i>
Specialty	<i>12 1 Software engineering</i>
Education Program	<i>Software engineering of computer systems</i>
Type of Course	<i>Normative (cycle of general training)</i>
Mode of Studies	<i>Full-time (full-time), part-time</i>
Year of studies, semester	<i>4th year, last semester</i>
ECTS workload	<i>6 ECTS credits. A total of 180 hours, all on Self-study</i>
Testing and assessment	<i>Final test</i>
Course Schedule	<a href="http://roz.kpi.ua">http://roz.kpi.ua</a> , <a href="mailto:comsys.kpi.ua">comsys.kpi.ua</a>
Language of Instruction	<i>English</i>
Head of the course / Course Instructors	<i>Assoc. prof., Ph.D., Volokita Artem Mykolayovych, <a href="mailto:artem.volokita@kpi.ua">artem.volokita@kpi.ua</a> Assoc. prof., Ph.D., Viktor Levovych Selivanov, <a href="mailto:v.selivanov2013@gmail.com">v.selivanov2013@gmail.com</a> assistant Ivanishchev Bohdan Vyacheslavovich <a href="mailto:callidus_iv@gmail.com">callidus_iv@gmail.com</a></i>
Access to the course	<a href="mailto:comsys.kpi.ua">comsys.kpi.ua</a> <a href="mailto:bbb_comsys.kpi.ua">bbb_comsys.kpi.ua</a>

### Outline of the Course

#### 1. Description of the academic discipline, its purpose, subject of study and learning outcomes

Description of the discipline. Pre-diploma practice of students is a mandatory component for obtaining a bachelor's degree in specialty 121 "Software engineering" of the "Computer systems software engineering" educational program.

Pre-diploma practice is aimed at systematizing, expanding and consolidating professional knowledge, forming students' initial competencies for conducting independent design and construction work and experimentation.

The main content of the pre-diploma practice consists in involving students in independent design and construction work, familiarization with the practice of entrepreneurship, issues of implementation of theoretical and practical developments in the field of their professional activity.

Pre-diploma practice by students is focused on obtaining the main results of design and construction work.

The subject of pre-diploma practice is deepening the skills of independent theoretical and practical work, broadening the worldview of students, researching practical problems and the ability

to connect them with the chosen direction, to determine the structure and logic of the future diploma project.

The program regulates the organizational and methodological support of the pre-diploma practice of students who master specialty 121 "Software engineering" of the educational program "Software engineering of computer systems" at the department of computer technology of the faculty of informatics and computer technology of KPI named after Igor Sikorsky.

**The purpose of the internship** is to master modern technologies for developing complex software systems used to solve the tasks of creating computer systems and subsystems, to acquire practical skills and the ability to work with modern CASE tools, mathematical and statistical data processing packages, as well as to gain experience working in a team.

**The task of practice** is to gain practical skills in designing business processes and creating information systems, working with modern packages of mathematical and statistical data processing; to master modern programming systems and creation of information bases; be able to create software products using Internet technologies; acquire and consolidate the skills of using and creating software documentation. The results of the practice are the Report, which contains part of the sections of the bachelor's diploma.

As a result of the internship, the student must master:

- CASE tools for designing computer systems;
- languages: UML and algorithmic programming languages;
- packages for mathematical data processing;
- database management systems used at the enterprise;
- Information Technology;
- mathematical methods for solving problems;
- the basics of drawing up design and technical documentation.

In accordance with the Educational and Professional Program, the educational component "Pre-Diploma Practice" consolidates (reinforces) the following **general competences** (GC):

- Ability to apply Knowledge in Practical Situations (GC2)
- Ability to learn and master Modern Knowledge (GC5)
- Ability to search, processing and analysis of Information, from different sources (GC6)

and ensures the consolidation of all **professional competences** (PC) of Educational Program: PC1-PC19

The educational component "Pre-Diploma Practice" supports the acquisition of all **program learning outcomes** (PLO) of Educational Program: PLO01-PLO28

## **2. Pre-requisites and post-requisites of the discipline (place in the structural and logical scheme of training according to the relevant educational program)**

### **Prerequisites:**

In order to successfully complete the tasks of the educational component "Pre-diploma practice", it is necessary to study and successfully master all disciplines - components of the Educational and Professional Program, which precede pre-diploma practice and diploma design.

### **Post-requisites:**

Knowledge, abilities and skills acquired by students as a result of pre-diploma practice are used in the next component - "Diploma design".

### 3. Content of the academic discipline

The main document that proves that the student has completed the pre-diploma practice program is a written report. The content of the report should reveal the student's knowledge and skills, acquired by him in solving the issues determined by the goal and task of the practice. In addition to the report, students must demonstrate the operation of the software product.

The report should contain the terms of reference (TOR), as well as sections:

#### 1 General provisions

##### 1.1 Description of the subject environment

###### 1.1.1 Description of the activity process

###### 1.1.2 Description of the functional model

##### 1.2 Overview of available analogues

##### 1.3 Statement of the problem

###### 1.3.1 Purpose of development

###### 1.3.2 Development goals and objectives

#### 2 Information support

##### 2.1 Input data

##### 2.2 Output data

2.3 Description of the structure of the database (or Structure of information arrays, if there is no database)

#### 3 Mathematical support

##### 3.1 Meaningful formulation of the problem

##### 3.2 Mathematical formulation of the problem

##### 3.3 Justification of the solution method

##### 3.4 Description of the solution method

#### 4 Software and hardware

##### 4.1 Development tools

##### 4.2 Requirements for technical support

### 4. Educational materials and resources

#### *Basic*

1. **Pre-diploma practice program** for students of the 4th year of specialty 121 "Software engineering" of the educational program "Software engineering of computer systems" The program is recommended by the department of OT (protocol No. 1 dated 08/29/2020); Approved by FIOT dean Telenyk S.F. / KPI named after Igor Sikorskyi; comp.: Rusanova O.V., Selivanov V.L. Website of the department of OT/
2. **Methodological recommendations for the implementation of the work program of practice according to the distance program of** Pre-diploma practice for students of the 4th year of the specialty 121 "Software engineering" of the educational program "Software engineering of computer systems" The program is recommended by the department of OT (protocol No. 1 dated 08/29/2020); Approved by the dean of FIOT Telenyk S.F./KPI named after Igor Sikorskyi; comp.: Rusanova O.V., Selivanov V.L. Website of the department of OT/

#### *Additional*

In this section, the student provides his list of literature, which is used in the thesis project.

## 5. The order of organization and management of pre-diploma practice

Pre-diploma practice for students of the IV course of specialty 121 "Software engineering" of the educational program "Software engineering of computer systems" is conducted in accordance with the curricula of full-time and part-time forms of education. During the course of pre-diploma practice and the implementation of the main tasks of the practice program, each student must obtain specific results from the topic, which will be reflected in the formulation of the topic of the bachelor's final qualification work.

The pre-diploma student internship program consists of the following parts:

- formation of an individual schedule of pre-diploma practice and familiarization of the student with domestic and foreign analogues in order to form a bibliographic list of literature by the student on the chosen topic of the diploma project. During this period, students are required to review regulatory documentation and printed literature, collect and process practical and informational material, select and process statistical data on the chosen topic;
- preparation of theses for presentation at a scientific and technical conference in the chosen direction;
- completion of an individual task, completion of work on the formation of the theme of the diploma project, preparation of a report on completion of pre-diploma practice and its defense.

Educational and methodical guidance and implementation of practice programs are provided by managers from the enterprise. The general organization of practice and control over its conduct at the department is carried out by the person responsible for pre-diploma practice at the department, who is appointed by the head of the department.

To directly supervise the practice of each student, the graduating department appoints a supervisor from among the teachers, who, as a rule, combines these duties with the duties of the supervisor of the diploma project.

### 5.1 The procedure for sending students to practice

Students are sent to practice according to the order of the university. The order determines the type of practice, the terms and place of its completion, the distribution and confirmation of students according to practice supervisors from departments, etc. The form of the order and the terms of its preparation are determined by the current requirements of the university.

When starting practice, the student must receive instruction on practice and safety techniques at the department in advance. Students are instructed during orientation meetings. Orientation meetings are intended to acquaint students with the requirements for the internship and the necessary documents. During the first meeting (1-2 calendar days before the start of practice), students are provided with sample documents for registration (such a list of documents may include: a referral letter for practice, a practice schedule, a curriculum and methodological instructions for practice, etc.) . In the event that the student independently chooses the object of practice, the indicated procedure for referral to practice must be clearly observed.

### 5.2 Responsibilities of the person responsible for pre-diploma practice from the department:

The person responsible for pre-diploma practice in the department is appointed by the head of the corresponding department.

The main duties of the person responsible for pre-diploma practice from the department are:

- organizing and conducting orientation meetings for students of the department (including instruction on safety and occupational health and safety) and providing them with the necessary documents before starting practice;
- ensuring the timeliness of students' formation of individual practice schedules and their receipt of individual tasks from direct supervisors;
- timely holding of orientation meetings on pre-diploma practice, familiarization of students with the requirements for the preparation of practice documentation, the reporting system and assessment criteria for practice, which are regulated by the relevant normative and methodical documentation on the organization and conduct of practice.
- advising students on the terms and procedure of practice, preparation of practice documents and protection of the report;
- ensuring the timely submission by students to the department of reports on pre-diploma practice and other documents necessary for defense, their verification and visa;
- timely organization and conduct of practice protection;
- reporting on the results of practice at the department meeting.

### **5.3 Responsibilities of heads of pre-diploma practice from departments**

In order to directly guide the practice of each student in accordance with the teaching load of the teachers, the department appoints (direct) supervisors of pre-diploma practice who take a direct part in the educational process.

Duties of practice managers appointed by departments are:

- developing and providing students with individual tasks and other instructions for practice, taking into account the specifics of the specialty;
- control over the timeliness of the formation and implementation of individual schedules of practice by students;
- advising students on the implementation of individual practice tasks and the preparation of practice documents;
- timely processing of feedback and preliminary assessment of the student's work in practice based on checking the practice report, the results of individual assignments and other practice documents.

### **5.4 Duties of managers of pre-diploma practice from enterprises**

For the direct supervision of each student's practice, the head of the enterprise - practice base appoints a (direct) supervisor of pre-diploma practice.

Duties of practice managers from the enterprise are:

- control of students' compliance with labor discipline and safety regulations;
- developing and providing students with individual tasks and other instructions for practice, taking into account the specifics of the specialty;
- control over the timeliness of the formation and implementation of individual schedules of practice by students;
- advising students on the implementation of individual practice tasks and the preparation of practice documents;
- creation of conditions for high-quality implementation of the internship program and assistance to students in obtaining materials for the report and improving their qualifications;
- timely processing of feedback (by assessing attitude to work, compliance with labor discipline, level of theoretical and practical training, etc.) and preliminary evaluation of the student's work in practice based on checking the practice report, the results of the individual task and other practice documents.

## 5.5 Duties of intern students

During pre-diploma practice, students of the department are obliged to:

- before the start of the practice at orientation meetings, and then individually, receive consultations from the head of the practice regarding the preparation of all necessary documents;
- arrive at the practice base in a timely manner (no later than the date specified in the referral);
- systematically work on tasks according to the practice program,
- fully perform all tasks provided for by the internship program, specified in the individual internship schedule and instructions of the immediate supervisor;
- strictly adhere to the working day regime, rules of internal procedure, occupational health and safety, operating on the basis of practice;
- to be responsible for the work done;
- to constantly maintain contacts with the department and to appear for interim control at the deadline appointed by the head of practice from the department;
- highlight the results of the work performed and issue them in the report on the completion of practice in accordance with the established and current requirements of the department for the structure and design of the report;
- to submit reporting documents to the department in a timely manner and to defend practice materials before the relevant commission in due time.

## Policy and control

### 6. Policy of academic discipline (educational component)

Both the teacher and the student are obliged to adhere to [the Code of Honor of the National Technical University of Ukraine "Kyiv Polytechnic Institute named after Igor Sikorsky »](#)

#### The main provisions of the policy:

- attending consultations appointed by the head of pre-diploma practice from the department;
- execution of the task plan by the student according to the individual task;
- during pre-diploma practice, students have the opportunity to raise any issue related to the procedure for conducting and evaluating control measures;
- students have the right to challenge the results of control measures, explaining with reason which criterion they disagree with according to the evaluation letter and/or comments;
- in case of discovery of the fact of academic dishonesty, the report on pre-diploma practice is not counted.

### 7. Types of control and rating system for evaluating learning outcomes (RSO)

#### 7.1 Forms and methods of control, summary of practice

The main tasks of the pre-diploma practice are reflected in the Practice Diary, which is kept according to the form approved by KPI named after Igor Sikorsky.

The student makes notes in the Diary - records the content and scope of the work performed, as well as its results - during the entire practice. The actual implementation is certified by the head of practice from the enterprise.

The result of the internship should be obtaining results that will be used in the further development of the intern, on the basis of which the topic of the diploma project will be clarified, and will be the basis of its writing. The results are drawn up in the form of a Pre-Diploma Practice Report.

At the end of the internship, the manager of the enterprise prepares feedback on the implementation of the internship program.

The Written Report, together with the Practice Diary, is submitted for review to the immediate supervisor of the practice from the department within the term determined by the relevant department and regulated by normative and methodical documents on the organization and conduct of practice.

Submitted to the department in accordance with the established procedure at the department. The report is checked by the head of practice from the department. If the results of the inspection of the Report reveal its compliance with the established requirements, the Report is recommended for defense before the commission.

In the case of detection of uncompleted works, non-compliance with the requirements of the faculty, the report is sent for revision.

Based on the results of checking the report, the direct head of practice from the department writes a general review and determines the assessment with which the report is recommended for defense before the commission. The assessment of the head of the practice is only a recommendation and is not a mandatory assessment of the defense for the commission.

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The report should contain the terms of reference (TOR), as well as the following possible sections:

- 1 General provisions
  - 1.1 Description of the subject environment
    - 1.1.1 Description of the activity process
    - 1.1.2 Description of the functional model
  - 1.2 Overview of available analogues
  - 1.3 Statement of the problem
    - 1.3.1 Purpose of development
    - 1.3.2 Development goals and objectives
- 2 Information support
  - 2.1 Input data
  - 2.2 Output data
  - 2.3 Description of the structure of the database (or other schemes, including structural, functional and principle schemes).
- 3 Mathematical support
  - 3.1 Meaningful formulation of the problem
  - 3.2 Mathematical formulation of the problem
  - 3.3 Justification of the solution method
  - 3.4 Description of the solution method
- 4 Software and hardware
  - 4.1 Development tools
  - 4.2 Requirements for technical support

## **7.2 The rating system for assessing the success of students in the credit module**

The rating of the student from the credit module " Pre-diploma practice" consists of the points he receives for:

1. Pre-diploma internship.
2. Receiving and completing the assignment for pre-diploma practice.

## System of rating points

### 1. Pre-diploma internship.

For 5 weeks (35 calendar days), students of the 4th year undergo pre-diploma practice at enterprises or organizations in accordance with the order of the university.

The number of points for the internship is **1 point for each calendar day of the pre-diploma internship**.

That is, a student who has worked all **35** calendar days can get **35** points ( $R_{1\max} = 35$ ).

A student who worked fewer calendar days ( $n$ ) receives  $n$  points ( $R_1 = n$ ). The number of worked calendar days  $n$  is calculated as follows:  $n = 35 - m$ , where  $m$  is the number of calendar days that the student missed (did not show up for practice according to information from the diary) without valid reasons.

If the student missed (did not show up for practice according to the information from the diary) due to good reasons (sickness), he must provide an appropriate medical certificate for the place of practice within three days from the moment of its closure (according to the current legislation of Ukraine). In the case of failure to submit a medical certificate within the deadline established by law, the reason for the absence is considered to be an absence without valid reasons.

A necessary condition for a student's admission to the credit is the condition:  $R_1 > 29$ .

### 2. Receiving and completing the assignment for pre-diploma practice.

On the first day of the pre-diploma practice, the student must receive from the supervisor of the bachelor's final thesis (project) a task for the pre-diploma practice, which should be at least 70% of the final thesis (project).

During the pre-diploma practice, the student performs the assigned task.

After completing the pre-diploma internship, the student draws up a **report** on the completion of the task and signs it with the supervisor of the bachelor's final thesis (project). The supervisor evaluates the performance of the task as a percentage ( $N\%$ ) relative to the performance of the entire graduation thesis (project) of the bachelor.

The number of points for each percentage of the entire graduation diploma thesis (project) of the Bachelor of Arts - **0.5** points. That is, a student who fully completed the task (70% or more) will receive **35** points ( $R_{2\max} = 35$ ).

If the student did not miss a single day of practice and completed the task in full, he receives an additional **30** points ( $R_{d\max} = 30$ ).

If a student missed several days of practice without valid reasons (but not more than 5) and completed the task in full, he receives an additional **20** points ( $R_d = 20$ ).

If a student missed several days of practice without valid reasons (but not more than 5) and completed the practice tasks by more than 66%, he receives an additional **10** points ( $R_d = 10$ ).

The minimum number of points for a student who is allowed to take the test is **60**.

Calculation of the size ( $R$ ) of the student's rating

The sum of the weighted points of control measures is  $R = R_1 + R_2 + R_d$ ,  
where

- $R_1$  – the sum of the weighted points of the control measures for passing practice;
- $R_2$  – the sum of weighted points of control measures for receiving and completing the task;
- $R_d$  – the sum of additional weight points.

The maximum value of the sum of weighted points ( $R_{\max}$ ) can be **100** points:

$$R_{\max} = R_{1\max} + R_{2\max} + R_{d\max} = 35 + 35 + 30 = 100.$$



The minimum value of the sum of weighted points (  $R_{\min}$  ) under the condition of admission to the credit can be **60** points:

$$R_{\min} = R_{1\min} + R_{2\min} = 30 + 30 = 60.$$

To receive credit from the credit module "**automatically**" you need to have a rating of at least **60** points.

A student is admitted to the defense of pre-diploma practice on condition of completion of all assigned tasks.

**Table of correspondence of rating points to grades on the university scale :**

<i>Rating value from credit module R</i>	<i>Traditional credit assessment</i>
100-95	Excelent
94-85	Very good
84-75	Good
74-65	Satisfactorily
64-60	Sufficient
Less than 60	Fail
Admission conditions not met	Not Graded

Summarizing the results of the pre-diploma practice takes place in the form of a differentiated assessment, which is accepted by the commission, the composition of which is determined by the head of the department (at least 2 members of the commission).

**Working program of the academic discipline (syllabus):**

**Designed by:**

- Associate professor, Ph.D., Artem Mykolayovych Volokita
- Associate professor, Ph.D., Viktor Levovych Selivanov

**Adopted by** Department of Computer Engineering (protocol № 10 25.05.2022)

**Approved by** the Faculty Board of Methodology (protocol № 10 09.06.2022)