Національний технічний університет України
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ
імені ІГОРЯ СІКОРСЬКОГО»

Department of Applied Radio Electronics

[RE-211-PRE BAK] PRE-GRADUATE PRACTICAL TRAINING

Curriculum of the academic discipline (Syllabus)

Details of the academic discipline

Level of higher education	First (bachelor's)
Field of knowledge	17 - Electronics, automation, and electronic communications
Specialization	172 - Electronic Communications and Radio Engineering
Educational program	Intelligent Technologies in Radio Electronics
Discipline status	Regulatory
Form of higher education	Full-time
Year of training, semester	4th year, spring semester
Scope of the discipline	6 credits (lectures, practical classes, laboratory classes, independent work: 180 hours)
Semester control/control measures	Credit
Class schedule	https://schedule.kpi.ua
Language of instruction	Ukrainian
Information about course coordinator/teachers	Head: V. M. Golovna

Course location https://do.ipo.kpi.ua/course/view.php?id=6457

Curriculum

1. *Description of the academic discipline, its purpose, subject matter, and learning outcomes*

Pre-diploma internship is the final stage of practical training for higher education seekers who are studying under the educational and professional bachelor's degree program.

The purpose of the internship is to summarize and consolidate the practical skills acquired at the university, to gain professional experience and the ability to work independently in an enterprise, institution, or organization, to master modern methods, forms of work organization, and tools in the field of telecommunications and radio engineering. It also aims to develop the following competencies in higher education students:

General:

- the ability to apply knowledge in practical situations (GC02);
- the ability to plan and manage time (GC 03);
- ability to communicate in the official language both orally and in writing (GC 05);
- ability to work in a team (GC 06);
- ability to learn and acquire modern knowledge (GC 07);
- ability to identify, set, and solve problems (GC 08);
- skills in carrying out safe activities (GC 09).

Professional:

- ability to solve standard professional tasks based on information and bibliographic culture using information and communication technologies and taking into account the basic requirements of information security (PC 02);
- ability to perform instrumental measurements in information and telecommunications networks, telecommunications and radio engineering systems (PC 06);
- ability to install, debug, configure, adjust, test, and commission telecommunications and radio engineering structures, facilities, and equipment (PC 10);
- ability to organize and implement occupational health and safety measures in the process of operation, maintenance, and repair of information and telecommunications networks, telecommunications, and radio engineering systems (PC 13);
- ability to participate in design and technological preparation, implementation into production and support of radio-electronic equipment production (PC 17);

The applicant for higher education must consolidate the knowledge acquired in all educational components and translate knowledge and skills into skills according to the following program learning outcomes:

- analyze, argue, and make decisions when solving specialized tasks and practical problems in telecommunications and radio engineering, which are characterized by complexity and incomplete certainty of conditions (PLO 01);
- apply the results of personal search and analysis of information to solve qualitative and quantitative problems of a similar nature in information and communication networks, telecommunications and radio engineering systems (PLO 02);
- have the skills to evaluate, interpret, and synthesize information and data (PLO 05);
- adapt to changes in information and communication networks, telecommunications and radio engineering systems (PLO 06);
- communicate on professional issues, including oral and written communication in the state language and one of the common European languages (English, German, Italian, French, Spanish) (PLO 10);
- apply interpersonal skills to interact with other people and engage them in teamwork (PLO 11);
- tolerantly accept and apply ethical standards of behavior towards other people (PLO 12);
- find, evaluate, and use information from various sources necessary for solving professional tasks, including reproducing information through electronic search (PLO 18);

- perform standard tests of information and communication networks, telecommunications and radio engineering systems for compliance with the requirements of domestic and international regulatory documents (PLO 19);
- explain the principles of construction and operation of hardware and software complexes of control and maintenance systems for the development, analysis, and operation of information and telecommunications networks, telecommunications, and radio engineering systems (PLO 20);
- monitor the technical condition of information and communication networks, telecommunications and radio engineering systems during their technical operation in order to identify deterioration in performance or failures, and systematically record this by means of documentation (PLO 22);
- apply the basics of designing radio-electronic equipment for intelligent systems and the latest component base and materials when designing radio-electronic equipment for intelligent systems (PLO 31).

2. *Prerequisites and post-requisites of the discipline (place in the structural-logical scheme of training under the relevant educational program)*

Prerequisites:

Design and production technologies of intelligent radio-electronic equipment, Occupational safety and civil protection, Computer modeling in intelligent systems

Post-requisites:

Diploma design

3. *Content of the academic discipline*

The content of the pre-diploma internship and the sequence of its implementation are determined by the program developed by the department in accordance with the curriculum in accordance with the educational and professional training programs for higher education seekers and the specifics of the enterprise where the internship takes place. The pre-diploma internship program is reviewed by the scientific and methodological commission of the Radio Engineering Faculty and approved by the dean of the faculty.
The pre-diploma internship program regulates all activities of higher education students and internship supervisors during the internship period. Guided by the program, the department outlines the requirements for the stages of the internship and the internship work programs, which are developed taking into account the specifics of the enterprise or organization where the internship will take place.

4. *Teaching materials and resources*

The literature is agreed upon with the internship supervisor and the scientific supervisor of the thesis in accordance with the chosen topic and taking into account the direction of work of the enterprise where the internship will take place. The literature can be found in the department's methodical rooms, the library of Igor Sikorsky KPI, and the enterprise.

Training manual on practical preparation for pre-diploma internship https://ela.kpi.ua/handle/123456789/61753

Basic:

1. Law of Ukraine "On Higher Education" dated 01.07.2014 No. 1556-VII [Electronic resource]. – Access mode: http://zakon4.rada.gov.ua/laws/show/1556-18
2. Practical training of bachelor's and master's degree seekers in radio engineering Faculty: recommendations for organizing and completing internships [Electronic resource] : textbook for higher education in specialty 172 "Electronic Communications and Radio

Engineering" / Igor Sikorsky KPI; compiled by V. M. Golovnya. – Electronic text data (1 file: 600.78 KB). – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2023. – 39 p. – Access mode
access: https://ela.kpi.ua/handle/123456789/61753

3. Regulations on the organization of the educational process at Igor Sikorsky KPI. – Access mode: https://osvita.kpi.ua/node/39
4. Regulations on the procedure for conducting internships for higher education students at Igor Sikorsky KPI. – Access mode: https://osvita.kpi.ua/node/184
5. Regulations on the system for preventing plagiarism, fabrication, and falsification at Igor Sikorsky KPI. – Access mode: https://osvita.kpi.ua/node/47

Additional:

1. DSTU 3008-2015 Reports in the field of science and technology. Kyiv: State Enterprise "UkrNDNC" 2016. - Access mode: https://re.kpi.ua/wp-content/uploads/2023/08/dstu3008-2015.pdf
2. Methodological recommendations on organizing student internships and developing internship work programs at the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" [Text] / Compiled by: N. M. Lapenko, I. L. Spivak, I. V. Fedorenko, O. M. Shapovalova; edited by P. M. Yablonsky. – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2018. – 29 p.
3. Regulations on current, calendar, and semester control of learning outcomes at Igor Sikorsky Kyiv Polytechnic Institute. – Access mode: https://osvita.kpi.ua/node/32

Educational content

5. *Methodology for mastering the academic discipline (educational component)*

Organizational measures that ensure the preparation and conduct of the internship include:

- development of internship programs for higher education students in accordance with educational programs, taking into account the place of internship; appointment of a person responsible for organizing internships for higher education students at the department;
- determination of internship bases;
- conclusion of agreements on the conduct of internships between the University and the enterprise, organization, institution;
- appointment of immediate supervisors for the internship from the department; • development of work programs for the internship;
- compiling topics for individual practical tasks;
- distribution of higher education applicants among internship bases;
- issuing internship referrals in accordance with the concluded agreements; • familiarization with the rules for filling out the internship diary;
- preparation of reporting forms based on the results of the internship (internship journal and report).

Internship:

From the very first days of the internship, higher education students must perform specific engineering tasks at the workplace, in accordance with the subject of the individual assignment, performing the duties of an engineer in a design bureau, workshop or factory laboratories, or research institute laboratories.

The work of higher education students at enterprises (institutions) during the internship must correspond to their specialty and include the following main elements:

1. Studying the purpose of tactical and economic requirements, operating conditions, operating principles, and the design of radio equipment manufactured or developed

in the enterprise's subdivision.

2. Performing engineering calculations.
3. Making models of individual radio equipment components and conducting experimental work.
4. Studying methods and participating in testing models and serial equipment.
5. Analysis of technical and economic indicators of the equipment under development and study of methods for calculating the economic efficiency of the designs being implemented.
6. Familiarization with the rules for recording, storing, and issuing documentation.

Final stage:

At the end of the internship, higher education students report on the completion of the program and individual assignments. The form of reporting for the internship is a written report, signed and evaluated directly by the supervisor at the internship site. The written report, together with the internship diary, is submitted for review to the internship supervisor from the University. The report should contain information about the student's completion of all sections of the internship program and individual assignment, conclusions and suggestions, a list of references, etc. The report is prepared in accordance with the requirements specified in the internship program.

The report is defended by higher education applicants before a commission appointed by the head of the department. The commission consists of faculty members who supervise the internship from the department and (if possible) the supervisor from the internship site. The commission accepts the higher education applicant's credit at the University within the first ten days after the end of the internship.

The result of the practical training assessment is entered into the assessment and examination record and the student's academic record book.

6. *Independent work of the student*

Individual assignment.

Completing individual assignments is the most important element of the higher education student's internship, which develops their independence and broadens their technical horizons. Individual assignments are compiled by internship supervisors from the University and the enterprise and are given to higher education students on the first days of their internship.

Individual assignments are related to the chosen topic of the qualification work. Each individual assignment must reflect technical and economic indicators, material on the chosen topic of the diploma project, justify the relevance of the development or research, present calculations, model the device or operating modes, and provide a list of references relevant to the direction of the work.

The materials for the individual assignment should be presented as a separate section/sections of the report.

Policy and control

7. *Policy of the academic discipline (educational component)*

University students undergoing practical training are required to:

- before the start of the pre-diploma internship, obtain from the internship supervisor at the University a referral, methodological materials (methodological guidelines, a work program for the pre-diploma internship, a diary, an individual assignment to be agreed with the scientific supervisor of the diploma) and advice on the preparation of all necessary documents;
- arrive at the internship site on time;

- fully complete all tasks specified in the internship work program and instructions of its managers;
- study and strictly adhere to the rules of labor protection, safety, industrial hygiene, and internal regulations;
- be responsible for the work performed;
- prepare reporting documentation in a timely manner and pass the practical training exam.

University policy on academic integrity

- The policy and principles of academic integrity are defined in Section 3 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute." For more information: https://kpi.ua/code
- The standards of ethical behavior for students and employees are defined in Section 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute." For more information: https://kpi.ua/code

8. *Types of control and rating system for assessing learning outcomes*

Admission to the defense (credit) of pre-diploma practice requires the mandatory presence of reporting documents with all necessary signatures and seals.

To present the results of the internship, the higher education applicant prepares a presentation and a report. Based on the quality and content of the report, diary, feedback from the internship supervisor, and the results of the higher education applicant's answers to questions, the commission members give a grade for the internship defense.

The rating of a higher education applicant for pre-diploma practice consists of the points he or she receives:

- for completing the diary -
5 points; • for the report
format - 10 points;
- for defending the report on pre-diploma practice - 85 points.

RATING POINT SYSTEM AND EVALUATION CRITERIA

1. Journal preparation (maximum 5 points):

I. Correctly completed diary (all fields filled in, necessary marks, stamps, signatures, and feedback from the company manager present) - 5 points;

II. Unformatted diary (no entries, no feedback from the company manager, no company stamps) – not accepted for credit.

2. *Report formatting (maximum 10 points), requirements:*

I. Highest quality report (8-10 points):

complete and comprehensive presentation of the material used during the higher education student's internship and during the study of the relevant section; relevance and reliability of the information presented in the report; compliance with the requirements, in accordance with the standards, regarding the content and formatting of the structural parts of the internship program.

II. Average quality of report formatting (5-7 points):

incomplete presentation of material or incomplete compliance of the content of the work with the requirements of the internship program and individual assignment (50-75% coverage of the issues specified in the internship program for the relevant discipline); irrelevance or obsolescence of the information presented in the report; non-compliance with the requirements for the content and format of the structural parts of the internship program.

III. Unsatisfactory quality of the report section (less than 5 points):

incomplete presentation of material or incomplete compliance of the content of the work with the requirements of the internship program (less than 50% coverage of the issues specified in the internship program for the relevant discipline); unreliability of the information presented in the report.

3. Defense of the pre-diploma internship report (maximum 85

points): I. 80- 85 points – highest quality defense of the internship

report:

fluency in the content of the work carried out during the internship, a clear understanding of the essence of the task under consideration, and possession of the relevant skills for solving technical problems in this field; complete knowledge of the relevant material and publications on the chosen topic;

II. 70-75 points if:

with regard to the defense, there is no correspondence to at least one of the points mentioned above, or if: during the disclosure of the content of the question as a whole, significant errors were made, which indicate a lack of competence that should have been acquired during the pre-diploma practice.

III. 60-65 points are awarded for the answer to the question if:

the answer to the highest score is not disclosed in two or more points specified in the requirements for it; the nature of the answers gives reason to believe that the person defending the practice report has misunderstood the content of the practice and therefore does not answer the question in essence, has made gross errors in the content of the answer.

IV. Less than 60 points:

if the content of the report does not fully correspond to the questions asked in the individual assignment; if it has not been agreed with the thesis supervisor and does not correspond to the approved topic;

When evaluating the internship report as a whole, the commission may additionally reduce the score for the following shortcomings and errors:

- errors in the formatting of the pre-diploma internship report compared to the current requirements (minus 5 points);
- incorrect statistical and analytical data, if the error is insignificant and does not affect the conclusions made in the report (minus 5 points);
- use of outdated scientific and information sources.

When compiling the pre-diploma internship assessment, the total number of points is influenced by the work discipline of the higher education applicant during the internship.

In case of violation of the schedule and content of the internship (recorded in the relevant journal), the commission may lower the grade for a single violation of the individual internship schedule and absence without valid reasons at the internship site at the appointed time or systematic tardiness (minus 2 points for each violation).

A higher education student who has not completed the internship program, received an unsatisfactory review at the internship site, or received an unsatisfactory grade during the defense of the report will be expelled from the University.

Table of correspondence between rating points and grades on the university scale

Number of points	*Grade*
100-95	Excellent
94-85	Very good
84-75	Good
74-65	Satisfactory
64-60	Sufficient
Less than 60	Unsatisfactory
Admission requirements not met	Not admitted

9. *Additional information on the discipline (educational component)*

ORGANIZATION OF PRACTICAL TRAINING IN DISTANCE MODE.

1. Practical training, which involves training at enterprises, institutions, or organizations, may be conducted remotely or directly at the premises of the enterprise, organization, or institution at the request of an adult applicant, provided that the training base is located as close as possible to their place of residence.
2. The decision on the form of all types of practice is made by the graduating department.

ORGANIZATION OF PRACTICAL TRAINING DURING ACADEMIC MOBILITY.

1. For higher education applicants who study according to an individual curriculum for academic mobility participants, the results of academic mobility programs are recognized as the results of practical training.
2. Upon completion of the higher education applicant's participation in the academic mobility program, but before the end of his/her individual study plan, recognize the results obtained under the academic mobility programs.

Description of material, technical, and informational support for the discipline

---

Working program of the academic discipline (syllabus):
Compiled by Holovna V. M.;
Approved by the PRE Department (Minutes No. 06/2025 dated 06/25/2025)
Approved by the methodological commission of the faculty/research institute (protocol No. 06/2025 dated 26.06.2025)