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

Machines and devices chemical and oil refining industries

Pre-graduate internship

Syllabus of the academic discipline (Syllabus)

Academic discipline requirements	
Level of higher education	***First (bachelor's)***
Discipline	*13 Mechanical Engineering*
Specialty	*133 Industrial mechanical engineering*
Educationalprogram	*Computer-integrated technologies for chemical engineering equipment design*
Discipline status	*Required*
Form of study	*full-time (day)*
Year of training, semester	*4th year, spring semester*
Scope of the discipline	*6 credits*
Semester control/control measures	*Test*
Class schedule	*http://rozklad.kpi.ua/Schedules/ScheduleGroupSelection.aspx*
Language of instruction	*Ukrainian*
Information about the course leader/teachers	*Bachelor's degree supervisors*
Course placement	https://ci.kpi.ua/uk/syllabuses-bac-disciplines/#place

1. The purpose and objectives of the practice

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

The purpose of the academic discipline is to develop students' competence in:

- *The ability to generate new ideas (creativity).*
- *The ability to think systematically.*
- *Ability to achieve set goals.*
- *Abilityapply professional knowledge to conceptualize engineering solutions;*
- *Abilityprepare initial data for the selection and justification of scientific, technical and organizational decisions;*
- *Abilityuse knowledge to analyze engineering products, processes and methods; ability to select and apply appropriate analytical and mathematical modeling methods;*
- *Abilityprovide modeling of technical objects and technological processes using standard packages and tools for automating engineering calculations, conduct experiments using specified methods with processing and analysis of results;*

1.2. Main objectives of the academic discipline.
After mastering the academic discipline, students must demonstrate the following program learning outcomes:

- *knowledge of the structure and production programs of the workshop, design bureau, department, laboratory; features of the technological process, design and development or research works, regularities of calculation, design, operation, repair of the main technological equipment; technical and economic indicators of the work of the workshop, department, design bureau*
  laboratories; measures for safety, labor protection, fire prevention, and production ecology.

2. Organization of internship

1. The head of the institution of professional pre-higher education is responsible for organizing and conducting practical training for applicants for professional pre-higher education. Measures related to the organization of practical training are determined by orders of the head of the institution of professional pre-higher education.

2. The general organization of the internship and control over its implementation in the educational institution is carried out by the head of the internship of the educational institution (deputy director or head of educational and industrial internship), who is appointed by order of the head of the institution of professional pre-higher education.

3. Educational and methodological guidance and implementation of the practical training program are provided by responsible cyclical commissions, which are determined by order of the head of the institution of professional pre-higher education.

4. Direct supervision of the internships of applicants for professional pre-higher education is carried out by internship managers from the educational institution, who are determined by the order of the head of the institution of professional pre-higher education, and (except for internships in structural units of the institution of professional pre-higher education) internship managers from the internship base, who are determined by the management of the internship bases in accordance with the agreement on practical training for applicants for professional pre-higher education.

5. Pedagogical and scientific-pedagogical employees of the institution of professional pre-higher education are involved in the management of the practice from the educational institution. Preference in the appointment of practice managers from the educational institution is given to experienced employees of responsible cycle commissions. The tasks of the practice manager from the educational institution are determined by the Regulations on the organization of the educational process in the institution of professional pre-higher education, and his powers on the basis of practice are determined by the agreement on the implementation of practical training of applicants for professional pre-higher education.

6. The rights and obligations of practice managers from the practice base are determined by the contract on practical training for applicants for professional pre-higher education.

7. The institution of professional pre-higher education provides applicants for professional pre-higher education with places for practical training in accordance with educational and professional programs and agreements on practical training of applicants for professional pre-higher education. In the case of practical training in a structural unit of an institution of professional pre-higher education, the responsibility for ensuring safe and harmless working conditions lies with the head of the

educational institution. During practical training, it is prohibited to use the work of applicants for professional pre-higher education for purposes not provided for by the educational and professional program.

8. Applicants for professional pre-higher education may undergo practical training through on-the-job training in the process of performing job duties. The educational institution may credit practical training in the procedure for recognizing learning outcomes specified in the educational and professional program, which are obtained during the applicant's employment during or before the start of training.

9. The duration of working hours of a student of professional pre-higher education during training internships should not exceed 36 academic hours per week, during industrial internships - the duration of the working day taking into account the age of the students in accordance with the legislation. During the internship, students are fully subject to the internal labor regulations of the internship base.

10. During the internship, the academic group may be divided into subgroups of at least 8 people.

11. Practical training of applicants for professional pre-higher education with special educational needs is carried out taking into account their individual needs and capabilities.

3. Content of the academic discipline

Section 1. Safety and occupational health

Topic 1.1. Safety and occupational health at the practice site

Topic 1.2. Safety and occupational health in the unit

Topic 1.3. Safety and health at work Topic 1.4. Study of the ecological foundations of environmental protection

Section 2. General information about the object of practice

Topic 2.1. Study of the work of the main structural divisions, the organization of their production and research activities

Topic 2.2. Study of the features of work and the range of production, research and development tasks, the solution of which is being worked on by a separate structural unit

Topic 2.3. Study of technical and economic indicators of the efficiency of the unit's work

Section 3. Work on an individual task

Topic 3.1. Preparation and study of materials for an individual assignment

4. Individual tasks

Individual tasks are determined by the internship supervisor depending on the topic of the bachelor's degree and must take into account the specifics of the topic.

A. List of the theoretical part:

1 Purpose and area of use of the installation

1.1 Description of the technological process

1.2 Selection of the type of installation, apparatus, its place in the technological scheme

2 Technical characteristics of the main devices of the installation

3 Description and justification of the chosen device design

3.1 Design and principle of operation of the device, main assembly units and parts
3.2 Comparison of the main indicators of the developed device design with analogues
3.3 Selection of materials for the structural elements of the device
3.4 Patent review of the designs of the main equipment of the installation
4 Calculations confirming the operability and reliability of structures
4.1 Parametric calculation of the device
4.2 Calculations for the strength and stability of the device (The total number of calculations for strength and stability is at least 5-6)

B. List of graphic material: schematic
diagram of the installation – A1, assembly
drawing of the device 1,
components and parts of the device 1 – 1…2 A1 formats

5. Educational materials and resources

5.1 Basic

1. *Methodological instructions for completing a report on industrial practice of the educational and qualification level "Bachelor" for students studying in the direction of training 6.050503 Mechanical Engineering: [Electronic resource]: / NTUU "KPI"; compiled by A. R. Stepaniuk. – Kyiv: NTUU "KPI", 2014. – 24 p.(Full text, pdf, 0.5 Mb)*
2. *Pre-diploma practice: rec. to practice in a distance learning format: teaching aids for bachelor's degree students in the educational program "Computer-integrated technologies for designing chemical engineering equipment" spec. 133 "Industrial mechanical engineering" / A.R. Stepaniuk; Igor Sikorsky Kyiv Polytechnic Institute. – Electronic text data (1 file). – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2024. – 44 p. –(Full text, pdf, 0.85 Mb)*
   (Full text, pdf, 0.65 Mb)
3. *DSTU 300895 Documentation. Reports in the field of science and technology Structure and rules of design*

6. Educational content

Student's independent work

Independent work constitutes 100% of the study of the credit module, which also includes preparation for the test. The main task of students' independent work is to deepen their knowledge by searching for the necessary information, forming basic skills for performing calculations in the field of mechanical engineering.

7. Policy and control

Academic discipline policy (educational component)Rules for assigning incentive and penalty points

- *Incentive points can be awarded by the teacher exclusively for the completion of creative works and working hypotheses.*
  But their sum cannot exceed 25% of the rating scale.
- *Penalty points are not provided within the framework of the academic discipline.*

Deadline and Rescheduling Policy
In the event of academic arrears in an academic discipline or any force majeure circumstances, graduate students should contact the teacher to agree on an algorithm of actions related to solving existing problems.

Academic Integrity Policy

Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the lack of references when using printed and electronic materials, quotes, opinions of other authors. Hints and copying when writing tests or conducting classes are unacceptable.
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". More details:https://kpi.ua/code

Academic Conduct and Ethics Policy

Graduate students must be tolerant, respect the opinions of others, formulate objections in a correct form, and adequately provide feedback in class.
The norms of ethical behavior of 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". More details:https://kpi.ua/code

8. Types of control and rating system for assessing learning outcomes (RSO)

Distribution of study time by types of classes and tasks in the discipline according to the working curriculum:

Semester	Study time		Distribution of teaching hours				Control measures		
	Loans	academic year	Lectures	Practical	Lab work	CRC	MKR	RR	Semester control
8	6	180	-	-	–	180	-	–	test

A student's rating in a discipline consists of the points he receives for:
Work on the report and test.

The semester test is a credit.

Rating (weighting) points system and evaluation criteria

Rating points system and evaluation criteria:

Report execution and report defense R =59+41 = 100 points

Where – 59 points, assessment of the quality of the report from practice and the searcher's work on the report

– 41 points score for the defense of the internship report by the searcher).

The maximum score is 100. To receive credit for a credit module

"Automatic" requires a rating of at least 60 points.

A prerequisite for admission to the test is a rating of at least 40% of the rating scale (R), i.e. 40 points.

To obtain a credit score, the sum of all received rating points R

is translated according to the table:

Number of points	***Rating***
95...100	*perfectly*
85...94	*very good*
75...84	*Good*
65...74	*satisfactorily*
60...64	*enough*
RD< 60	*unsatisfactorily*
Admission conditions not met	*not allowed*

The working program of the academic discipline (syllabus):

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Approved by the Department of the Institute of MACORI (Minutes No. 20 dated 12.06.2025)

Approved by the Methodological Commission of the Faculty (Minutes No. 11 dated 06/27/2025)