



Web - programming

Working program of the academic discipline (Syllabus)

Details of the academic discipline

Level of higher education	<i>First (undergraduate)</i>
Branch of knowledge	<i>13 "Mechanical engineering"</i>
Specialty	<i>133 Industrial engineering</i>
Educational program	<i>Computer-integrated technologies of chemical engineering equipment design</i>
Discipline status	<i>selective</i>
Form of education	<i>daytime</i>
Year of training, semester	<i>2nd year, autumn semester</i>
Scope of the discipline	<i>4 ECTS credits / 120 hours</i>
Semester control/ control measures	<i>assessment, modular control work, calculation work</i>
Lessons schedule	<i>3 hours per week (1 hour of lectures and 2 hours of computer workshop)</i>
Language of teaching	<i>Ukrainian</i>
Information about the head of the course / teachers	<p>Lecturer: associate professor of the Department of the National Academy of Sciences of the Russian Academy of Sciences, candidate of technical sciences Oleg Anatoliyovych Novokhat, e-mail : novokhatoleh @ gmail . com , telegram: @Novokhat_Oleh</p> <p>Practical: associate professor of the Department of the National Academy of Sciences of the Russian Academy of Sciences, candidate of technical sciences Oleg Anatoliyovych Novokhat, email : novokhatoleh@gmail.com, telegram: @Novokhat_Oleh</p>
Placement of the course	<i>https://ci.kpi.ua/uk/syllabus-2022-2023/</i>

Program of educational discipline

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

At the present time, for familiarization and sale of both goods and services, consumers need free access to them. One of the most effective means of providing information in free access is the presence of a corresponding site.

This discipline is devoted to the study of the principles of building algorithms, basic methods and basic syntax.

The purpose of this discipline is to develop students' knowledge and experience in creating web applications.

The subject of studying the discipline is basic syntax, studying the basics of algorithmization, principles of building web pages.

In the process of studying the discipline, the student will master the methods and approaches of building web pages, their adaptation for mobile devices.

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

This academic discipline is optional. To successfully master this discipline, a student must meet all of the following criteria:

- have the skills and abilities to work with a personal computer at the level of a confident user;
- know and understand the basic principles of information organization in computer systems;
- learn the "Informatics" course;
- be interested in acquiring knowledge and experience in developing web pages and building algorithms.

The knowledge, skills and experience gained while studying this discipline will be useful for:

- mastering the disciplines "Three-dimensional design";
- further professional activity.

3. Content of the academic discipline

The educational discipline " Web programming " consists of the following topics:

1. Topic 1. Overview of programming languages.
2. Topic 2. Introduction to web technologies.
3. Topic 3. An example of working with *HTML* and *CSS* .
4. Topic 4. Fundamentals of JavaScript programming .
5. Topic 5. Basics of language programming PHP .

4. Educational materials and resources

Basic literature

1. Tsesliv , Olga Volodymyrivna. WEB-programming: teaching . help _ / O.V. Tsesliv ; Ministry of Education and Science, Youth and Sports of Ukraine, NTUU "KPI". - Kyiv: NTUU "KPI", 2011. - 298 p.
2. Borodkina , Iryna Lavrentiivna, author . WEB-technologies and WEB-design: the use of the HTML language to create electronic resources: a study guide for higher educational institutions / I.L. Borodkina , G.O. Borodkin ; Ministry of Education and Science of Ukraine; Ministry of Culture of Ukraine; Kyiv National University of Culture and Arts. - Kyiv: Lira-K, 2020. - 211 pages: illustrations.
3. Tsvirkun, Leonid Ivanovich. Global computer networks. Programming in the PHP language: a study guide for students of higher educational institutions / L.I. Tsvirkun, R.V. Linden; Ministry of Education and Science of Ukraine, State Higher Educational Institution "National Mining University". - Dnipropetrovsk: NSU, 2013. - 239 p. : ill ., table.

Additional literature

1. Knut D. Art programming : in 3 vols. M.-St. Petersburg- Kiev : Williams , 2009.
2. D. Flanagan . JavaScript : The Definitive Guide : Activate Your Web Pages . O'Reilly Media . April 2011. - 1096
3. E. Castro "HTML and CSS for creation Web-pages " Publisher : NT Press, 2006
4. D. Flanagan . JavaScript Pocket Reference , 3rd Edition . - O'Reilly Media . April 2012. - 280

Electronic resources

1. Online programming learning service <https://www.codecademy.com>
2. Online programming learning service <https://www.codeavengers.com>
3. Online programming learning service <https://www.codeschool.com>
4. Online programming learning service <https://teamtreehouse.com>

Educational content

5. Methods of mastering an educational discipline (educational component)

The structure of the credit module

Names of topics	Number of hours				
	In total	including			
		lectures	practical	practical	SRS
Topic 1.1. History of development of programming languages . Standards and browsers.	4	2			2
Topic 2.1. HTML: syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames.	22	4	8		10
Topic 2.2. CSS: syntax, units of measurement, text formatting, element styles, positioning.	10	2	4		4

Topic 2.3. Static and adaptive layout.	10	2	4		4
Topic 2.4. Technology for creating flexible layouts: flexbox and bootstrap . Chrome Developer Tools .	10	2	4		4
Topic 3. Basics of working with the JavaScript programming language	21	4	8		9
Topic 4. Introduction to PHP , Interpreter: principle and modes of operation.	16	2	6		8
Abstract (website development)					15
Modular control work	6		2		4
Preparation for the exam	6				6
In total	120	18	36		66

Lecture classes

No. z/p	The name of the topic of the lecture and a list of main questions (a list of didactic tools, references to the literature and tasks on the SRS)
Programming languages	
1	Development of programming languages. Modern programming languages and development environments. Topic 1.1. History of development of programming languages . <i>Literature:</i> basic [1, 2], auxiliary [1-4].
Basics of <i>HTML</i> and <i>CSS</i>	
2	Web page markup. Work with text and images. Topic 2.1. <i>HTML</i> : syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames. <i>Literature:</i> basic [1, 2], auxiliary [1-4]. Task on SRS: creating a background from a repeating picture.
3	Types of links in <i>HTML</i> - structure. "Page within a page". Filling out forms. Topic 2.1. <i>HTML</i> : syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames. <i>Literature:</i> basic [1, 2], auxiliary [1-4]. Tasks on SRS: Ajax technology (familiarization).
4	Creating a cascading style sheet . Topic 2.2. <i>CSS</i> : syntax, units of measurement, text formatting, element styles, positioning. <i>Literature:</i> basic [1, 2], auxiliary [1-4]. Tasks on SRS: media requests .
5	Flexible sites and their advantages over static ones. Topic 2.3. Static and adaptive layout. <i>Literature:</i> basic [1, 2], auxiliary [1-4]. Task on SRS: using tables to create a static page.
6	Application of technologies for quick positioning of site elements. Topic 2.4. Technology for creating flexible layouts: flexbox and bootstrap . Ways to quickly correct the site code . Chrome Developer Tools . <i>Literature:</i> basic [1, 2], auxiliary [1-4]. task: testing flexbox and bootstrap technologies on outdated versions of browsers .
Programming in the <i>JavaScript</i> language	
7	Basics of JavaScript programming . Introduction to JS, Interpreter: principle and modes of operation. Arithmetic, logical and conditional operators. Cycles Topic 3. Basics of working with the JavaScript programming language <i>Literature:</i> basic [1, 2], auxiliary [1-4]. Tasks on SRS: logical values and expressions.
8	Functions

	<p>Topic 3. Basics of working with the JavaScript programming language</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p> <p>Tasks on SRS: scopes, data transfer to a function</p>
PHP programming	
9	<p>The basics of working with PHP .</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p> <p>Tasks on SRS: Wordpress technology .</p>

Practical training

No. z/p	The name of the topic of the lecture and a list of main questions (a list of didactic tools, references to the literature and tasks on the SRS)
Basics of <i>HTML</i> and <i>CSS</i>	
1	<p>Web page markup using Working with text.</p> <p>Topic 2.1. <i>HTML</i>: syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
2	<p>Work with images and backgrounds.</p> <p>Topic 2.1. <i>HTML</i>: syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
3	<p>Creation of tables and forms, their formatting.</p> <p>Topic 2.1. <i>HTML</i>: syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
4	<p>Application of frames.</p> <p>Topic 2.1. <i>HTML</i>: syntax, elements, attributes, head and body elements , identifiers and classes, path to files, working with text: headings, paragraphs, quotes, comments, setting colors, working with backgrounds, lists, links, forms, tables, working with images, symbols and symbolic objects, emoji , set of symbols, frames.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
5	<p><i>CSS</i> syntax</p> <p>Topic 2.2. <i>CSS</i>: syntax, units of measurement, text formatting, element styles, positioning.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
6	<p>Application of multiple cascading style sheets</p> <p>Topic 2.2. <i>CSS</i>: syntax, units of measurement, text formatting, element styles, positioning.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
7	<p>Creation of a static site.</p> <p>Topic 2.3. Static and adaptive layout.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p> <p>Task on SRS: using tables to create a static page.</p>
8	<p>Creation of a flexible (adaptive) site.</p> <p>Topic 2.3. Static and adaptive layout.</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p> <p>Task on SRS: using tables to create a static page.</p>
9	<p>Flexbox</p> <p>Topic 2.4. Technology for creating flexible layouts: flexbox and bootstrap . Ways to quickly correct the site code . Chrome Developer Tools</p> <p><i>Literature:</i> basic [1, 2], auxiliary [1-4].</p>
10	<p>Bootstrap . Methods of quick adjustment of the site.</p> <p>Topic 2.4. Technology for creating flexible layouts: flexbox and bootstrap . Ways to quickly correct the</p>

	site code . Chrome Developer Tools <i>Literature:</i> basic [1, 2], auxiliary [1-4].
Programming in the <i>JavaScript</i> language	
11	Information input and output methods Topic 3. Basics of working with the JavaScript programming language <i>Literature:</i> basic [1, 2], auxiliary [1-4].
12	Arithmetic, logical and conditional operators. Topic 3. Basics of working with the JavaScript programming language <i>Literature:</i> basic [1, 2], auxiliary [1-4].
thirteen	Cycles Topic 3. Basics of working with the JavaScript programming language <i>Literature:</i> basic [1, 2], auxiliary [1-4].
14	Functions Topic 3. Basics of working with the JavaScript programming language <i>Literature:</i> basic [1, 2], auxiliary [1-4]. Tasks on SRS: scopes, data transfer to a function
PHP programming	
15	Introduction to PHP . Arrays, loops, functions. <i>Literature:</i> basic [1, 2], auxiliary [1-4].
16	Functions. <i>Literature:</i> basic [1, 2], auxiliary [1-4].
17	Forms <i>Literature:</i> basic [1, 2], auxiliary [1-4].
18	Converting an HTML web page to a PHP web page . <i>Literature:</i> basic [1, 2], auxiliary [1-4].

Laboratory classes

According to the curriculum, laboratory classes are not provided

6. Independent work of student

Independent work makes up about 50% of the total volume of the discipline.

Independent work of students within this course involves:

- preparation for the lecture, which includes familiarization with the provided text of the lecture, identification of poorly understood fragments and theses, identification of questions that, in the student's opinion, need wider coverage, preparation of questions to the teacher that are planned to be asked during the lecture
- preparation for practical classes, which includes familiarization with the topic and purpose of the class, tasks, familiarization with control questions and formation of answers to them;
- preparation of reports based on the results of work carried out in practical classes;
- execution of the essay in the form of website development according to the task;
- preparation for modular control work;
- exam preparation.

Policy and control

7. Policy of academic discipline (educational component)

7.1 Rules for attending classes and behavior in classes

Attending classes is mandatory. Applicants are obliged to take an active part in the educational process, not to be late for classes and not to miss them without valid reasons, not to interfere with the teacher conducting classes and not to be distracted by actions unrelated to the educational process.

7.2 Rules for assigning incentive and penalty points

Incentive points can be awarded by the teacher exclusively for the performance of creative works and working hypotheses. But their sum cannot exceed 25% of the rating scale.

Penalty points are not provided within the academic discipline.

7.3 Deadlines and Rescheduling Policy

In the event of academic debts arising from the academic discipline or any force majeure circumstances, applicants should contact the teacher to coordinate the algorithm of actions related to solving existing problems.

7.4 Academic Integrity Policy

Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the absence of references when using printed and electronic materials, quotes, opinions of other authors. Inadmissible tips and write-offs during writing tests, conducting classes.

The policy and principles of academic integrity are defined in Chapter 3 of the Code of Honor of the National Technical University of Ukraine "Ihor Sikorsky Kyiv Polytechnic Institute". More details: <https://kpi.ua/code>

7.5 Policy of academic conduct and ethics

Applicants must be tolerant, respect the opinion of others, formulate objections in the correct form, adequately support feedback during classes.

Standards of ethical behavior of students and employees are defined in Chapter 2 of the Code of Honor of the National Technical University of Ukraine "Ihor Sikorskyi Kyiv Polytechnic Institute". More details: <https://kpi.ua/code>

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

The student's credit module rating consists of points obtained for:

- 1) performance of 18 practical works in classroom classes;
- 2) execution of modular control work;
- 3) execution of the abstract (website development).

8.1. Performance of practical works.

A total of 18 practical works are provided during the semester. The weighted point is 2. The maximum number of points for all works is equal to $2 \times 18 = 36$ points. Points are awarded as follows:

- work tasks were completed correctly and on time, within the set time of the lesson, correct answers were received - 2 points;
- the task of the work was completed partially correctly during the set time of the lesson, and it was not completed completely, in a time exceeding the time of the practical lesson, a part of the correct answers was received - 1 point;
- the work task was not completed or was completed completely incorrectly - 0 points.

Note: if the student was absent from the lesson/ s for a valid reason, which is documented and presented at the next lesson the completed assignment of the missed work /s, the work is considered completed on time.

8.2. Modular control work.

The weighted score is 4. The modular test consists of two practical tasks. The weighting point of each task is 2 points. Evaluation of each work task is carried out separately according to the following scale:

- data analysis is correct, the answer is correct - 2 points;
- the process of data analysis is generally correct, but there are errors that do not make it possible to get a correct answer, only the analysis algorithm is given, but the analysis itself is missing or completely incorrect - 1 point;
- incorrectly selected data analysis method, incorrectly selected analysis algorithm or missing task - 0 points.

8.3. Abstract (website development)

The weighted score is 10. The calculation work consists of a complex task.

Evaluation of the work task is carried out according to the following scale:

- performance of the task is correct, the answer is correct - 10 points;
- the progress of the task is generally correct, but there are non-critical errors, the prompt correction of which will allow you to get a correct answer - from 8 to 9 points;
- the progress of the task is generally correct, but there are sufficiently gross errors that do not make it possible to get a correct answer - from 5 to 7 points;
- only certain fragments are given correctly, but the task itself is not performed, or performed completely incorrectly - from 2 to 4 points;
- the method of performing the task is incorrectly chosen, the calculation formulas are incorrectly specified or the task is missing, work performed in gross violation of the rules and norms of academic integrity is evaluated with a score of 0 points.

The abstract, for which less than 2 points were received, is considered not counted.

The maximum number of points during the semester is: **$R = 36 + 4 + 10 = 50$ points.**

Calendar control : *is carried out twice a semester as a monitoring of the current state of meeting the requirements of the syllabus .*

Semester control : **exam.**

Conditions for admission to the semester control : ***a positive assessment for the essay (2 points or more) and receiving a total of 23 points or higher for the discipline.***

According to the results of the educational work in the first 7 weeks, the "ideal achiever" should score 18 points. At the first certification (8th week), the applicant receives "credited" if his current rating is at least 9 points.

According to the results of the educational work for 13 weeks of training, the "ideal achiever" should score 40 points. At the second attestation (14th week), the applicant receives "credited" if his current rating is at least 20 points.

The maximum number of points is 100.

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

Scores	Rating
100 ... 95	<i>perfectly</i>
94 ... 85	<i>very good</i>
84 ... 75	<i>fine</i>
74 ... 65	<i>satisfactorily</i>
64 ... 60	<i>enough</i>
0 ... 60	<i>unsatisfactorily</i>
0 ... 23	<i>not allowed</i>

9. Additional information on the discipline (educational component)

9.1. Execution of examination work.

Students who scored a rating of less than 23 points during the semester or did not complete the essay are not allowed to take the exam.

The weighted score of the exam is 50 points. The work consists of three practical tasks. The weighted score of two tasks is 15 points, the third one is 20 points. The practical task involves the student solving typical problems from the credit module. The assessment of the practical task is carried out according to the following scale:

- the approach to the solution is correct, the answer is correct - from 14(19) to 15(20) points;
- the approach to the solution is correct, but the answer is incorrect due to the presence of minor errors - from 11(15) to 13(18) points depending on the number of indicated errors;
- the approach to the solution is generally correct, but there are sufficiently gross errors that do not make it possible to get a correct answer - from 6(10) to 10(14) points, depending on the number and severity of errors;
- only fragments of the task are correct, but the task itself is missing or completely incorrect - from 1(1) to 5(9) points, depending on the number and correctness of the available elements;
- the calculation method is incorrectly chosen, the solution strategy is incorrectly chosen or the task is missing - 0 points.

9.2. Enrollment of distance or online course certificates.

For students who have completed distance learning or online courses on the relevant subject, this training can be counted as studying this academic discipline if all the following conditions are met:

- the student provided a certificate or other document that confirms his completion of a distance or online course and provided an opportunity to verify its authenticity;
- a distance or online course posted on the platform or conducted by an organization that is recommended or recognized by KPI named after Igor Sikorskyi;
- the volume of a distance or online course is at least 108 study hours;
- the list of topics studied in the distance or online course contains at least four topics specified in the content of the academic discipline (item 3 of the syllabus); in the case of a difference in titles, the correspondence of the content of the topics is established on the basis of a comparative analysis with the distance or online course program;
- the student's success rate based on the results of studying a distance or online course is at least 75% of the maximum.

The working program of the academic discipline (syllabus):

Compiled by an associate professor of the MAHNV department, candidate of technical sciences Oleg NOVOKHAT

Approved by the Department of Machines and Apparatus of Chemical and Oil Refining Industries (Protocol No. 20 dated 06/20/2022)

Agreed by the Methodical Commission of the Faculty of Engineering and Chemistry (protocol No. 10 dated June 24, 2022)