[RE-7] PROGRAMMING IN SCRIPTING LANGUAGES

Work program of the academic discipline (Syllabus)

Course details

Level of higher education	First (bachelor's)
Field of knowledge	G - Engineering, manufacturing, and construction
Special and radio engineering	G5 - Electronics, electronic communications, instrument engineering,
Educational program	All
Discipline status	Elective (F-catalog)
Form of higher education	Full-time
Year of training, semester	Available for selection starting from the 2nd year, fall semester
Scope of the discipline	4 credits (Lectures 16 hours, Practical 0 hours, Lab 30 hours, Independent work 74 hours) Semester
Control/control measures	Credit
Class schedule	https://schedule.kpi.ua
Language of instruction	Ukrainian
Information about the course leader/teachers	Lecturer: V. S. Mosiychuk, Lab: V. S. Mosiychuk, SRC: V. S. Mosiychuk
Course location	https://sylabus.online/course/7-prohramuvannia_na_skryptovykh_movakh

Curriculum

1. Description of the course, its purpose, subject matter, and learning outcomes The

purpose of the course is to develop students' abilities to:

- create software for information and telecommunications networks in scripting languages;
- design and optimize databases;
- create web service software;
- automatically obtain and update information from web services;

- teamwork on a joint project;
- ensure software version control during its continuous improvement.

Learning outcomes:
Knowledge: client-server information and telecommunications systems architecture; scripting language syntax; database design and optimization methods; fundamentals of the Internet of Things concept.

Skills: designing and creating complex web services based on the Internet of Things concept, developing client-server applications and client scripts; developing algorithms and programs in scripting languages, operating databases.

Experience: creating web services for radio engineering information systems; using external services to transmit, receive, and update information necessary for the functioning of radio engineering systems.

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

Basic programming skills in C are desirable.

3. Content of the discipline

Names of sections and topics	Number of hours				
	Total	including			
		Lectures	Practical work	Laboratory (computer workshop)	SRC
1	**2**	**3**	**4**	**5**	**6**
Chapter 1. Scripting Languages					
Topic 1. Software configuration	2	2			
Topic 2. Designing web services and Applications	4	2			
Topic 3. Data exchange formats	4	2			2
Topic 4. Introduction to PHP	4	2			2
Topic 5. Classes and objects in PHP	5	3			2
Topic 6. Database management systems SQL	4	2			2
Topic 7. Working with forms in PHP	4	2			2
Topic 8. Cookies and sessions. PHP application security	4	2			2
Topic 9. Automatic data exchange with external services	2				2
Test	3	1			2
Section 2. Software Development					
Topic 10. Working with Services and Version Control Software	10			8	2
Topic 11. Debugging programs and searching web service errors	10			8	2
Topic 12. Designing a relational database and its optimization	14			10	4
Topic 13. Gaining experience in team work on a project	20			10	10
Credit	18				2

Names of sections and topics	Number of hours				
	Total	including			
		Lectures	Practical work	Laboratory (computer workshop)	SRC
Total hours	90	18	–	36	36

4. Teaching materials and resources

Recommended reading

1. Basic

1. Web services and applications: lecture course [Electronic resource]: textbook for students majoring in 172 "Telecommunications and Radio Engineering," specializing in "Radio Communications and Signal Processing" / V.S. Mosiychuk; Igor Sikorsky Kyiv Polytechnic Institute. – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2019. – 81 p.

2. Supplementary

Web services and applications: lecture course [Electronic resource]: textbook for students majoring i n 172 "Telecommunications and Radio Engineering," specializing in "Radio Communications and Signal Processing" / V.S. Mosiychuk; Igor Sikorsky Kyiv Polytechnic Institute. – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2019. – 81 p.

3. Information resources

1. W3School [Electronic resource]. – Access mode: http://w3school.com. – Title from the screen.

Educational content

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

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Laboratory

Since PV6 is part of the **professional and practical** training **cycle**, considerable attention is paid to the practical component of the course. Therefore, a larger number of classroom hours are allocated to laboratory work (computer practicals). *The main objectives* of the workshop are to experimentally verify theoretical knowledge, acquire skills in designing and implementing web service software in scripting languages, and connect to and obtain information from external web services.

6. Independent work of students

No. No	Title of the topic for independent study	Number hours SRC
1	Topic 10. Working with version control services and software Git instructions and commands. Connecting to GitHub. Commit, Push, Fetch, and Merge functions. Resolving conflicts with version control. Literature: • Git in 30 Minutes: https://codeguida.com/post/453	2

2	Topic 13. Gaining experience in teamwork on a project MC timing. Basics of teamwork using the Scrum methodology. Creating a backlog. Prioritization. Identifying factors that hinder project implementation and eliminating them. Conducting stand-ups. The role of the Scrum Master and the project owner. Literature: • Scrum Learn to do twice as much in half the time	10

Policy and control

7. Academic discipline policy (educational component)

Rules for attending classes (both lectures and practical/laboratory classes)

Laboratory work is mandatory. If these classes are missed, they must be made up during consultations or with other groups. If lectures are missed, tests on the material covered in the missed class must be taken and passed. Lecture materials and videos are posted on the LMS.

Defense of laboratory work

Laboratory work is defended on the day the laboratory work is completed. The student receives two grades. The first is for activity and initiative during the laboratory work and individual classes. The second is for the defense and answers to control questions.

Defense of individual assignments

As part of their independent work, students complete assignments based on lecture materials. Based on the results of the review, course participants receive comments from the instructor and a grade. Individual assignments cannot be retaken.

Incentive and penalty points and academic integrity policy

The most active students and students who complete individual assignments in an exemplary manner can receive up to 10 points towards their semester grade.

Penalty points are applied in cases where someone else's work is presented as their own, with mandatory subsequent reworking.

Deadline and resubmission policy

If the deadlines for submitting assignments are missed, the maximum score for the assignments is reduced by 10% for course participants.

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

The RE-7 course curriculum provides for the following rating system:

• Lectures/webinars - 18 hours (2 MCR x 15 points)
• Lab work/training sessions - 36 hours (25 assignments, 30 points) •
Educational project (4 stages x 10 points)

Control works

The modular test consists of 2 separate parts (in the form of tests) and is conducted to check the quality of knowledge acquired in lectures and to monitor independent work.

Assignments for **the educational project**:

1) to determine, according to the task, the classes of objects in the subject area (entities) whose information is to be stored in the database, their properties, and possible relationships between entities;

2) develop an infological model (entity-relationship model);

3) normalize the relational database and transition to a logical model;

4) implement the database in the MySQL DBMS;

5) write PHP scripts for entering information into the database, displaying data on the screen, and searching the database.

Table of correspondence between rating points and university scale grades

Number of points	Grade
100-95	Excellent
94	Very good
84	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)

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

Training takes place in a computer lab in the form of workshops. The computer lab is equipped with 12 computers, but preference is given to students working on their own laptops. Software: XAMPP server (Apache, PHP, MySQL), JetBrains PhpStorm, GitHub, Slack, or Trello.

Work program for the academic discipline (syllabus):
Compiled by V. S. Mosiychuk;
Approved by the PRE Department (Minutes No. 06/2025 dated 06/24/2025)
Approved by the methodological commission of the faculty/research institute (protocol No. 06/2025 dated 25.06.2025)