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

Department of Applied Radio Electronics

[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	17 - Electronics, Automation, and Electronic Communications
Specialization	172 - Electronic Communications and Radio Engineering
Educational program	All educational programs
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 18 hours, Practical 0 hours, Lab 36 hours, Independent work 66 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 placement	https://sylabus.online/course/7-prohramuvannia_na_skryptovykh_movakh

Curriculum

1. **Description of the course, its purpose, subject matter, and learning outcomes The aim** 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;
- work in a team 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; the basics 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. Course content

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 for 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
Total hours	90	18	–	36	36

4. Learning 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

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.

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 classes

Since discipline PV6 belongs to **the cycle of disciplines** of **professional and practical** training, considerable attention is paid to the practical component of training. Therefore, a larger number of classroom hours are allocated to laboratory work (computer workshop). *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 the student

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 you miss these classes, you must make them up during consultations or with other groups. If you miss lectures, you must take and pass tests on the material covered in the missed class. Lecture materials and videos are posted on the LMS.

Defense of laboratory work

Laboratory work is defended on the day of completion. Students receive two grades. The first is for activity and initiative during laboratory work and individual study. 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 assessment, 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 rating.

Penalty points are applied in cases of passing off someone else's work as one's own, with mandatory reworking of the work.

Deadline and retake 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 assessment and rating system for evaluating learning outcomes

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

- Lectures/Webinars - 18 hours (2 Module control work 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 move to the 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. 06/2024 dated 06/27/2024)
Approved by the methodological commission of the faculty/research institute (protocol No. 06-2024 dated 28.06.2024)