



COURSE PROJECT IN MULTIMEDIA INTERFACES AND 3D VISUALIZATION

Syllabus

Details of the educational component

Level of higher education	<i>Second (Master)</i>
Branch of knowledge	<i>12 Information Technologies</i>
Specialty	<i>121 Software Engineering</i>
Educational program	<i>Software Engineering of Multimedia and Information-Retrieval Systems</i>
Status of the educational component	<i>Normative</i>
Form of education	<i>Full-time</i>
A year of training	<i>1 year, Autumn semester</i>
The scope of the educational component	<i>Independent work of a student: 30 academic hours</i>
Semester control / control measures	<i>The course project defence</i>
Schedule of classes	<i>n/a</i>
Language of instructions	<i>English</i>
Information about head of the course / teachers	<i>Commission for the reception of defences of the Course Work: DSc, assoc. prof. Yevgeniya Sulema, sulema@pzks.fpm.kpi.ua PhD Oksana Shkurat, shkurat@pzks.fpm.kpi.ua</i>
Course location	<i>Google classroom. Access is given to registered students.</i>

Program of educational component

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

The purpose of the course work on the educational component "Multimedia interfaces and 3D visualization" is to form in students the ability to independently develop software that implements the latest multimedia user interfaces and 3D visualization tools.

The subject of the course work on the educational component "Multimedia interfaces and 3D visualization" is the hardware and software of the processes of presentation, transformation and reproduction of multimedia information.

Completion of the course work in the educational component "Multimedia interfaces and 3D visualization" allows students to develop the competencies necessary for solving practical problems of professional activity related to software development using the latest multimedia interfaces and 3D visualization:

PC02 – Ability to develop and implement scientific and / or applied projects in the field of software engineering;

PC12 – Ability to design complex multimedia and information retrieval systems;

PC15 – Ability to develop and implement software projects, including in-house research, that enables the solution of significant technical, social, scientific, cultural, ethical and other problems;

PC17 – Ability to apply software engineering methodologies in practice;

PC19 – Ability to design multimedia software interfaces.

The program results of the course work in the educational component "Multimedia interfaces and 3D visualization":

PLO04 – Identify information needs and classify data for software design;

PLO05 – Develop, analyze, justify and systematize software requirements;

PLO07 – Analyze, evaluate and apply at the system level modern software and hardware platforms to solve complex problems of software engineering;

PLO08 – Develop and modify software architecture to meet customer requirements;

PLO09 – Choose reasonable paradigms and programming languages for software development, apply modern software development tools in practice;

PLO10 – Modify existing and develop new algorithmic solutions for detailed software design;

PLO13 – Configure software, manage its changes and develop software documentation at all stages of the life cycle;

PLO15 – Carry out software reengineering in accordance with customer requirements;

PLO16 – Plan, organize and perform software testing, verification and validation;

PLO32 – Be able to develop multimedia systems and interfaces;

PLO33 – Be able to develop software for 3D visualization systems.

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

Successful completion of the course project in the educational component "Multimedia interfaces and 3D visualization" is preceded by the study of the educational components "Programming", "Object-oriented programming", "Mathematical analysis", "Linear algebra and analytical geometry" of the curriculum for bachelors in the specialty 121 Software engineering software.

The theoretical knowledge and practical skills obtained as a result of course project in the educational component "Multimedia interfaces and 3D visualization" can be used during the preparation of a master's thesis.

3. A typical assignment for a course project

Development of a voice interface and multimedia assistant for a selected software system (for example, a travel planning system).

Basic requirements for the software system:

1. The presence of developed dialogues, as they cover a large number of practical situations of using the voice interface.
2. The presence of a graphic interface in the form of an animated multimedia character that visualizes voice interaction.

Individual requirements are determined by the technical task, which is an integral part of the coursework documentation. The technical task is agreed with the manager.

4. Organization of execution and defense of course project

- Course project is performed by a group of three students. A typical distribution of roles between performers:
 1. Development of software system architecture and logic and integration of software product components.
 2. Development of voice interface components.
 3. Graphic modeling and animation.

- *The course project consists of a software system and its documentation. The documentation includes three separate parts; each performer prepares his own textual documentation according to his part of the task. The technical task is part of the first part of the documentation.*
- *The course project is defended in the form of a presentation with a demonstration of the developed software product.*

5. Course project preparation schedule

- *Division into groups and specification of a standard task – **by October 11, 2022.***
- *Development and agreement of the technical task – **by October 21, 2022.***
- *Demonstration of the beta version of the software product – **until December 6, 2022** (according to a separate schedule)*
- *Protection of coursework – **until December 20, 2022** (according to a separate schedule).*

6. Educational materials and resources

Basic literature:

1. Educational and methodological materials for the educational component "Multimedia interfaces and 3D visualization".

Use to master practical skills in the educational component. The materials are in Google classroom. Access is granted to registered students.

Policy and control

7. Policy of academic educational component

- *Adherence to the policy of academic integrity.*
- *The rules for assigning incentive points are as follows. Incentive points are awarded for: creative approach in course project (maximum number of points is 5 points).*

8. Rating system for evaluating learning outcomes

The maximum number of points for the course project: 100 points.

Points are awarded for:

- *software product quality, 0-25 points*
- *complexity (branching) and quality of voice interface implementation, 0-25 points*
- *quality of graphic modeling and animation, 0-25 points*
- *quality and completeness of documentation, 0-10 points*
- *quality and completeness of the presentation and demonstration of the software product, 0-10 points*
- *timeliness of presentation of work for defense, 0-5 points.*

Criteria for evaluating the quality of a software product:

24-25 points – the development is done qualitatively, in full;

20-23 points – the development is done qualitatively, in full, but has minor flaws;

6-19 points – the development is carried out to a sufficient extent, but contains shortcomings;

0-5 points - robotic development and is not completed in full or contains significant shortcomings.

Criteria for evaluating the complexity (branchingness) and quality of voice interface implementation:

24-25 points – the implementation of the voice interface is done qualitatively, the complexity is high;

20-23 points – the implementation of the voice interface is done qualitatively, the difficulty is average;

6-19 points – the implementation of the voice interface is done qualitatively, the complexity is low;

0-5 points – the implementation of the voice interface is incomplete or contains significant shortcomings.

Criteria for evaluating the quality of graphic modeling and animation:

24-25 points – graphic modeling and animation are done qualitatively, in full;

20-23 points – graphic modeling and animation are done well, but there are minor flaws;

6-19 points – graphic modeling and animation are performed to a sufficient extent, but there are shortcomings;

0-5 points – graphic modeling and animation are not fully completed or there are significant shortcomings.

Criteria for evaluating the quality and completeness of documentation:

10 points – the documentation is done at a high level, there are no comments;

6-9 points – the documentation is done qualitatively, but has shortcomings;

1-5 points – the documentation is completed at an acceptable level, but has significant shortcomings;

0 points - the documentation is done poorly.

Criteria for evaluating the quality and completeness of the presentation and demonstration of the software product:

10 points – the presentation and demonstration were performed at a high level, there are no comments;

6-9 points – the presentation and demonstration are done well, but there are shortcomings;

1-5 points – the presentation and demonstration are performed at an acceptable level, but there are significant shortcomings;

0 points – the presentation and demonstration were performed poorly.

Criteria for evaluating the timeliness of work submission for defense:

5 points – the work is submitted for defense no later than the specified deadline;

0 points – the work is submitted for defense later than the specified deadline.

The maximum number of points for completing and defending a coursework:

25 points + 25 points + 25 points + 10 points + 10 points + 5 points = 100 points.

Semester control: course project defence.

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

Scores	Rating
100-95	Excellent
94-85	Very Good
84-75	Good
74-65	Satisfactory
64-60	Fair
Less than 60	Unsatisfactory
Admission conditions not met	Not allowed

The syllabus prepared by DSc, assoc. prof. Yevgeniya Sulema.

Approved by the PZKS department (protocol No. 13 dated 22.06.2022).

Approved by the Methodical Commission of the Faculty of Applied Mathematics (protocol No. 9 dated 24.06.2022).