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

Кафедра програмного забезпечення комп'ютерних систем

Multimedia Systems Software. Course work

Syllabus

Requisites of the Course	
Cycle of Higher Education	***First (Bachelor)***
Field of Study	*12 Information technologies*
Speciality	*121 Software Engineering*
Education Program	*Software Engineering of Multimedia and Information Retrieval Systems*
Type of Course	*Normative*
Mode of Studies	*full-time*
Year of studies, semester	*4 year, 7 semester*
ECTS workload	*30 hours for self-study*
Testing and assessment	*Credit*
Course Schedule	*Not provided*
Language of Instruction	*English*
Course Instructors	*phD, Shkurat Oksana* *shkurat@pzks.fpm.kpi.ua*
Access to the course	*Google classroom.*

Outline of the Course

1. Course description, goals, objectives, and learning outcomes

The purpose *of studying the discipline "Multimedia Systems Software. Course work" is to form the students' abilities to independently develop software that implements the processes of accumulation, storage, transformation, recognition, retrieval and display of multimedia data.*

The subject *of the discipline "Multimedia Systems Software. Course work" are mathematical, algorithmic and software support of the processes of presentation, transformation, recognition of multimedia information.*

Study of the discipline "Multimedia Systems Software. Course work" contributes to the formation of students of ***professional competences (PC)*** *necessary for solving practical tasks of professional activity related to the software development for the multimedia data transformation:*

PC08 *Ability to apply fundamental and interdisciplinary knowledge to successfully solve software engineering problems.*
PC19 *Ability to develop software for multimedia and mulsemedia systems.*
PC20 *Ability to apply the acquired fundamental mathematical knowledge to develop calculation methods in the multimedia and information retrieval systems creation.*

Study of the discipline "Multimedia Systems Software. Course work" forms students' ***program learning outcomes*** *(PLO) according to the educational program:*

PLO01 *To analyze, purposefully search and select the necessary information and reference resources and knowledge to solve professional problems, taking into account modern advances in science and technology.*

PLO02 *To know the professional ethics code, understand the social significance and cultural aspects of software engineering and adhere to them in professional activities.*
PLO03 *To know the software life cycle basic processes, phases and iterations.*
PLO07 *To know and to apply in practice the fundamental concepts, paradigms and basic principles of the functioning of language, instrumental and computational tools of software engineering.*
PLO08 *To know and to be able to develop a human-machine interface.*
PLO09 *To be able to use collecting, formulating and analyzing software requirements methods and tools.*
PLO10 *To conduct a pre-project survey of the subject area, system analysis of the design object.*
PLO11 *To select initial data for design, guided by formal methods of describing requirements and modeling.*
PLO12 *To apply effective approaches to software design in practice.*
PLO13 *To know and apply methods of developing algorithms, designing software and data and knowledge structures.*
PLO15 *To choose programming languages and development technologies to solve the problems of creating and maintaining software.*
PLO17 *To be able to apply methods of component software development.*
PLO18 *To know and be able to apply information technology of processing, storage and transmission of data.*
PLO19 *To know and be able to apply software verification and validation methods.*
PLO20 *To know approaches to evaluation and quality assurance of software.*
PLO23 *To be able to document and present the software development results.*
PLO25 *To know and to be able to use fundamental mathematical tools in the algorithms construction and modern software development.*
PLO26 *To be able to develop and use methods and algorithms for the mathematical problems approximate solution during the multimedia and information retrieval systems design.*
PLO27 *To be able to use statistical data analysis methods.*
PLO28 *To know the mathematical and algorithmic basics of computer graphics and to be able to apply them to develop multimedia software.*
PLO29 *To know the principles of using the latest multimedia technologies, mulsemedia and immersive technologies.*
PLO31 *To be able to identify, analyze and document software requirements for multimedia and information retrieval systems.*
PLO32 *To be able to develop and analyze full cycle models for multimedia and information retrieval systems software creation.*
PLO38 *To be able to apply programming technologies for multimedia and information retrieval systems software development.*
PLO42 *To know the basic presentation models of textual and multimedia information and methods of its pre-processing for use in the design of information retrieval systems.*
PLO43 *To know and be able to use in practice the existing software resources and libraries for processing of textual information and multimedia data in information retrieval systems.*
PLO44 *To know the most common query languages used in the development of information retrieval systems.*

2. Prerequisites and post-requisites of the course (the place of the course in the scheme of studies in accordance with curriculum)

Successful study of the discipline "Multimedia Systems Software. Course work" precedes the study of disciplines "Programming", "Programming. Course work", "Components of Software Engineering", "Standardization and Technologies for Multimedia and Information Retrieval Software Products

Development", "Standardization and Technologies for Multimedia and Information Retrieval Software Products Development. Course work" of the curriculum for training bachelors in the specialty 121 Software engineering.

Received during the assimilation of the discipline "Multimedia Systems Software. Course work" theoretical knowledge and practical skills will ensure successful completion of pre-diploma practice and completion of diploma projects in the specialty 121 Software Engineering.

3. Typical task of course work

The multimedia software (MS) devepopment.

The main requirements for MS:

1. The conversion module (accumulation, processing, visualization and storage) of text, graphic, sound data.

2. The graphical user interface.

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

3. Organization of defense and completion of course work

Course work is performed individually or in a group of two or three students.
In the case of group coursework, a typical distribution of roles between performers:
1. Development of architecture, logic of MS and integration of software product components.
2. Graphic modeling and animation.
3. Development of the user interface.

The coursework consists of a software system and its documentation. The documentation includes a title page, a fact sheet, terms of reference, an explanatory note and a user guide. In the case of group coursework, participants prepare their own text documentation according to their part of the task, but the technical task, notice and user guide are the same for each participant.

The course work is defended in the form of a presentation with a demonstration of the developed software product.

4. Coursework schedule

*Coordination of the technical task of the course work - until **September 27, 2022.***
*Demo of the beta version of the software product - until **November 27, 2022** (according to a separate schedule)*
*Defense of the course work - until **December 25, 2022 (**according to a separate schedule).*

5. Educational materials and resources

Basic literature:

1. Educational materials from the discipline " Multimedia Systems Software. Course work". Use to master practical skills in the discipline. The materials are in Google classroom. Access is granted to registered students.

Course policy and control

6. Policy of academic discipline

Rules of conduct in the classroom: compliance with safety requirements.

Rules for the protection of individual tasks: compliance with the principle.

Rules for awarding incentive points: incentive points are awarded for performance of analytical work on topics agreed with the teacher up to 10 points.

Policy of deadlines and rescheduling: classes that are missed without good reason, are completed in the allotted time at the end of the semester. Students have the possibility of two reshuffles in the presence of the commission.

Other requirements that do not contradict the legislation of Ukraine and regulations of the University: when taking the test students must follow safety rules.

Policy on academic integrity: policy, principles of academic integrity, and norms of ethical behavior of students and employees of the University are defined in the code of honor of KPI named after Igor Sikorsky (see: https // kpi.ua / code).

7. Types of control and rating system for assessing learning outcomes (RSM)

The maximum number of points for the course work: 100 points.
Points are calculated for:
- a preliminary demonstration of a multimedia software product, 0-26 балів;
- quality of multimedia software product development, 0-26;
- quality of development of technical documentation, 0-14;
- protection of a multimedia software product, 0-14
- timeliness of execution of a multimedia software product, 0-20.

Evaluation criteria for a preliminary demonstration of a multimedia software (MS):
0-8 points – MS presence;
0-10 points – MS quality;
0-10 points – MS completion.
The maximum number of points for the preliminary demonstration of MS is 26 points.

Criteria for evaluating the quality of multimedia software development:
0-8 points – the modernity and validity of the applied technologies for the MS development;
0-8 points – availability and quality of independently created multimedia components (images, videos, three-dimensional models, animation, audio accompaniment);
0-10 points – availability and quality of self-developed MS.
The maximum number of points for the quality of MS development is 26 points.

Criteria for evaluating the quality of the development of MS technical documentation:
0-7 points – completeness of technical documentation;
0-7 points – quality of technical documentation.
The maximum number of points for the quality of development of MS technical documentation is 14 points.

Evaluation criteria for MS protection:
0-7 points – completeness and quality of the report, presentation and demonstration of the MS;
0-7 points – completeness and quality of answers to questions.
The maximum number of points for protection of MS is 14 points.

Criteria for evaluating the timeliness of MS implementation:
0-10 points – timeliness of approval of the MS topic;
0-10 points – timeliness of submission of MS for protection.

The maximum number of points for completing and defending a coursework: 26 points + 26 points + 14 points + 14 points + 20 points = 100 points.

Semester control: credit

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

Score	*Grade*
100-95	*Excellent*
94-85	*Very good*
84-75	*Good*
74-65	*Satisfactory*
64-60	*Sufficient*
Below 60	*Fail*
Course requirements are not met	*Not Graded*

Syllabus of the course

Is designed by teacher PhD, Senior lecturer, Shkurat Oksana;

Adopted by Computer Systems Software Department (protocol № 12 from 26.04.23)

Approved by the Faculty Board of Methodology (protocol № 10 from 26.05.23)