Course Syllabus

I. General Information

Course name	Multimedia programming
Programme	Informatics
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BA
Form of studies (full-time, part-time)	full-time
Discipline	Informatics
Language of instruction	English

Course coordinator	Rafał Stęgierski, PhD

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture	30	V	5
tutorial			
classes			
laboratory classes	30	V	
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Ability to programming in C/C++ and library usage Knowledge of object oriented programming

II. Course Objectives

C1 - Getting to know the concept of multimedia
C2 - Getting to know the methods of handling interaction with the user
C3 - Getting to know the Qt environment and libraries
C4 - Getting to know the handling of 2D and 3D graphics, including OpenGL
C5 - Introduction to audio and video processing

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	He knows the algorithms used in handling multimedia data.	K_W03
W_02	Has knowledge of the basic components of building multimedia systems.	K_W04
W_03	Has knowledge of graphics, video and their processing in the context of multimedia.	K_W11
W_04	Student know how to use proper algorithms in multimedia solutions.	K_W06
SKILLS		
U_01	Can find information in sources necessary to design, build and implement a multimedia system.	K_U02
U_02	Knows and uses the terminology related to the handling of multimedia data.	K_U04
SOCIAL COMPETENCIES		
K_01	He can assess the level of his knowledge in the context of creating multimedia applications.	K_K01

IV. Course Content

1. Multimedia concept
2. Characteristics of multimedia data
3. Multimedia databases
4. Transferring multimedia data
5. Processing of graphic data
6. Qt and Qt Widgets, QGraphicsScene
7. OpenGL
8. GLSL
9. Video
10. QMultimedia

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
KNOWLEDGE			
W_01	Brainstorming/discussion group	Observation	Report file
W_01	Brainstorming/discussion group	Observation	Report file

W_02	Brainstorming/discussion group	Observation	Report file
W_03	Brainstorming/discussion group	Observation	Report file
W_04	Brainstorming/discussion group	Observation	Report file
SKILLS			
U_01	Project-based learning design thinking	Preparation of the project	Project rating card
U_02	Project-based learning design thinking	Preparation of the project	Project rating card
SOCIAL COMPETENCIES			
K_01	Brainstorming/discussion group design thinking	Observation	Protocol

VI. Grading criteria, weighting factors.....

For the grade 3 student:
W1 - knows the concept of multimedia and is able to characterize its components
U1 - Can prepare a simple multimedia application in Qt
U2 - He knows the concepts behind QGraphicsScene
K1 - can individually plan work on the application

For the grade 4 student:
W1 - knows the relationships between the various types of multimedia content
W2 - knows how the mechanisms of multimedia databases function
U1 - implement support for various types of multimedia data
U2 - can use OpenGL to visualize three-dimensional data
K1 - work individually and in groups plan work on the application

For a grade of 5, the student is able to:
W1 - can indicate methods of indexing and searching multimedia content
W2 - knows the advanced characteristics of multimedia data
W3 - use video processing in multimedia system creation
U1 - Uses GLSL shaders to configure the visualization pipeline in OpenGL

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	30
Number of hours of individual student work	80

VIII. Literature

Basic literature
Ze-Nian Li, Mark S. Drew, Jiangchuan Liu, Fundamentals of Multimedia, Springer Lee Zhi Eng, Qt5 C++ GUI Programming Cookbook, Packt
Additional literature
Jürgen Ryannel, A Book about Qt5, https://qmlbook.github.io/