Course Catalogue Engineering and ICT

EXCHANGE PROGRAMME

Games Programming 2026-2027

SVP: MH.ICTGP.V26

Description of the educational unit

Course code: V.ICTGPCG Credits: **10** Ec's Target group: **Voltijd Regulier**

Description	Computer Graphics
Competences	-
Target group	You design and develop robust C++ software components for a (serious) game or simulation, using appropriate language features and object-oriented principles. You make deliberate design and implementation choices regarding data structures, memory management, class design, polymorphism, operator overloading, templates, and file processing, taking into account the specific characteristics of C++ such as pointers and references. You write code that is aligned with relevant quality standards for software development.You design and develop interactive 3D graphics applications by applying the principles of the graphics pipeline and underlying mathematical concepts. You make deliberate design and implementation choices regarding transformations, rendering, shading, textures, materials, and camera systems for a coherent virtual environment, and create and integrate visual assets into this environment. You create solutions that result in interactive visual applications and meet relevant quality standards for software development.

Educational content	• C++
	  • IO, streams
	  • C Strings
	  • Pointers
	  • Classes, inheritance, polymorphism, operator overloading
	  • STL
	  • Creating templates
	  • Bit operators
	• Computer Graphics
	  • Theoretical and mathematical background
	  • Transformations
	  • Texture mapping
	  • Viewing pipeline
	  • Shaders
	  • OpenGL
	  • Digital Content Creation (DCC)

Teaching methods	• Lectures • Labs • Assignments: in pairs and individual
Teaching aids	See Electronic Learning Environment
Supervisory activity	• Explanation of theory • Practice implementation in classroom • Discussion and question answering
Sequentiality	
Level	Gevorderd (Advanced)
Grading domain	1 t/m 10, 1 dec.

Assesment

Sub assessment	Gradingdomain	Weight	Caesura
C++ lab exam	1 t/m 10, 1 dec.	35	Hoger of gelijk aan 5.5
DCC	Niet voldaan t/m Voldaan	0	Hoger of gelijk aan 5.5
Final Assignment	1 t/m 10, 1 dec.	35	Hoger of gelijk aan 5.5
Homework 1	1 t/m 10, 1 dec.	15	Hoger of gelijk aan 5.5
Homework 2	1 t/m 10, 1 dec.	15	Hoger of gelijk aan 5.5

Reading list	
Practical actions	

Description of the educational unit

Course code: V.ICTGPAAI Credits: **5** Ec's Target group: **Voltijd Regulier**

Description	Game Algorithms and Artificial Intelligence
Competences	-
Target group	You apply knowledge of game algorithms and AI techniques in the design and development of movement, planning, intentional behaviour and similar intelligence of entities in a game or simulation. You create entities in your game which are autonomous, complex, and dynamically adapt to their environment and other entities. You design and implement a system that adheres to relevant quality standards for software development.
Educational content	• Steering behaviours • Path planning • Goal-driven behaviour • Finite state machines • Fuzzy logic • Backtracking • Minimax algorithm
Teaching methods	• Lectures • Take-home assignment: in pairs
Teaching aids	See Electronic Learning Environment
Supervisory activity	• Explanation of theory • Classroom exercises • Discussion and question answering
Sequentiality	
Level	Gevorderd (Advanced)
Grading domain	1 t/m 10, 1 dec.

Assesment

Sub assessment	Gradingdomain	Weight	Caesura
Take-home assignment	1 t/m 10, 1 dec.	2	Hoger of gelijk aan 5.5
Theory exam	1 t/m 10, 1 dec.	1	Hoger of gelijk aan 5.5

Reading list	Mat Buckland (2004). *Programming Game AI by Example*. : Jones & Bartlett Learning
Practical actions	

Description of the educational unit

Course code: V.ICTGPPRJ Credits: **15** Ec's Target group: **Voltijd Regulier**

Description	Game Project
Competences	-
Target group	Analysis, Advisory You analyze the requirements and context of a software project and translate these into well-founded technical and creative directions. You evaluate possible solutions and make informed choices regarding design approaches, algorithms, and technologies, considering trade-offs in complexity and feasibility. You give advice that is based on your analysis and supports decision-making within the project team and leads to a clear and achievable project direction. Design, Realization You design and develop a software solution within a collaborative project setting, resulting in a coherent and functional product. You make deliberate design and implementation choices and integrate different components, such as algorithms, graphical techniques, and software structures, into a consistent whole. You apply appropriate programming principles and technologies to create interactive and responsive functionality. You contribute to a technically sound solution, which meets the agreed requirements and relevant quality standards. Manage&Control You manage and monitor your own work and contribute to the organization of the project. You plan tasks, set priorities, and track progress using appropriate development methods and tools. You manage the project source code using software version management tools & standards. You collaborate effectively within the team, communicate about technical decisions, and ensure alignment between different parts of the project. You identify risks and bottlenecks and take appropriate actions to maintain progress and quality. You carry out the project in a structured way and meet agreed deadlines and requirements.
Educational content	You will have the option to choose between: • Designing and implementing your own game. • Creating a (serious) game for a real client. • Doing research into new technology and building a prototype game demonstrating the capabilities. • Alternative options to be approved by lecturer. The project has to meet a number of criteria, and will be approved or disapproved by a lecturer. The project requires the use of challenging technology.
Teaching methods	• Working in a project group • Workshops
Teaching aids	See Electronic Learning Environment
Supervisory activity	Through digital media and oral communication
Sequentiality	
Level	Gevorderd (Advanced)
Grading domain	1 t/m 10, 1 dec.

Assesment

Sub assessment	Gradingdomain	Weight	Caesura
Assessment	1 t/m 10, 1 dec.	1	Hoger of gelijk aan 5.5

Reading list	
Practical actions	