Course Catalogue Engineering and ICT

EXCHANGE PROGRAMME

Games Programming 2025-2026

Course summary

VOE Code: ICT.KS.INT ECTS credits: 1 Level: Bachelor's degree (full-time)

Course Title	International Course
Type	Optional
Learning competences	
Learning outcomes	The student can give a presentation of 30 minutes for a mixed audience about the differences in (inter)cultural aspects between The Netherlands and their home country.
Course content	Content of the presentation shows aspects that vary from food and habits to teaching and/or working in a company. Some theoretical aspects need to be included, like the dimensions of Hofstede (country comparison) or the ones from Hall. It can start with a general introduction of the country itself. The 30 minutes consist of 20 minutes presentation and 10 minutes Q and A with the audience.
Planned learning activities and teaching methods	Presentation for audience
Recommended or required reading and other learning resources / tools	• Student's laptop. • Big monitor/screen in the room.
Prerequisites and co-requisites	You are required to have two years of Bachelor's study experience and English-language skills at B2 level.
Level	Advanced
Grading scale	1 up to 10, 1 dec.
Assessment methods and criteria	Pass or fail
Language of Instruction	English
Name of lecturer	For information about the lecturers you can contact Matthieu van Bekkum
Mode of delivery	Face to face

Course summary

VOE Code: ICT.GP.PRJCT.V22 ECTS credits: 10 Level: Bachelor's degree (full-time)

Course Title	Project Games Programming
Type	Compulsory
Learning competences	
Learning outcomes	You will create a (serious) game in a small group of fellow students.
Course 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. • .. 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.
Planned learning activities and teaching methods	See Electronic Learning Environment
Recommended or required reading	• Working in a project group • Workshops

and other learning resources / tools			
Prerequisites and co-requisites	You are required to have English-language skills at B2 level and at least 120 ECTS credits in Computer Science or Software Engineering. Experience in C# and/or Java, algorithms and data structures, OO design and programming, UML and design patterns and software engineering practices is also necessary. When you apply for this programme, we will check if your current skills and knowledge match the requirements.		
Level	Advanced		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	**Type of assessment**	**Grade weighting**	**Criteria**
	Assessment	1	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Matthieu van Bekkum		
Mode of delivery	Face to face		

Course summary

VOE Code: ICT.GP.AAI.V22 ECTS credits: 6 Level: Bachelor's degree (full-time)

Course Title	Algorithms and Artificial Intelligence for games		
Type	Compulsory		
Learning competences			
Learning outcomes	During this course students will learn about algorithms specifically for games and how to apply various artificial intelligence techniques to create intelligent computer players.		
Course content	Some of the topics that will be covered are: • Generating and Solving Mazes • Backtracking Techniques • Minimax algorithm and Alfa-Beta Pruning • Path Planning • Steering Behaviours • State Machines • Goal-driven Behaviours • Fuzzy Logic		
Planned learning activities and teaching methods	• Lectures • Labs • Assignments		
Recommended or required reading and other learning resources / tools	See: Electronic Learning Environment		
Prerequisites and co-requisites	You are required to have English-language skills at B2 level and at least 120 ECTS credits in Computer Science or Software Engineering. Experience in C# and/or Java, algorithms and data structures, OO design and programming, UML and design patterns and software engineering practices is also necessary. When you apply for this programme, we will check if your current skills and knowledge match the requirements.		
Level	Advanced		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	**Type of assessment**	**Grade weighting**	**Criteria**
	Assignment	2	Higher or equal to 5.5
	Theory exam	1	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Matthieu van Bekkum		
Mode of delivery	Face to face		

Course summary

VOE Code: ICT.GP.CG.V22 ECTS credits: 5 Level: Bachelor's degree (full-time)

Course Title	Computer Graphics		
Type	Compulsory		
Learning competences			
Learning outcomes	Almost every game is played in a graphical two- or three-dimensional space. In this course you will learn how to create these environments. The theoretical basis will be covered, as well as practical implementation using OpenGL and other libraries. With the help of these libraries you can manipulate objects in space and change their look and feel with respect to the material the object is made of.		
Course content	Topics: • Shaders • Transformations • Texture Mapping • 3D Modeling • Theoretical and mathematical background • CPU vs GPU		
Planned learning activities and teaching methods	• Lectures and labs (combined) • Assignments in pairs		
Recommended or required reading and other learning resources / tools	See Electronic Learning Environment.		
Prerequisites and co-requisites	You are required to have English-language skills at B2 level and at least 120 ECTS credits in Computer Science or Software Engineering. Experience in C# and/or Java, algorithms and data structures, OO design and programming, UML and design patterns and software engineering practices is also necessary. When you apply for this programme, we will check if your current skills and knowledge match the requirements.		
Level	Advanced		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	**Type of assessment**	**Grade weighting**	**Criteria**
	Final assignment	5	Higher or equal to 5.5
	Homework 1	2.5	Higher or equal to 5.5
	Homework 2	2.5	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Matthieu van Bekkum		
Mode of delivery	Face to face		

Course summary

VOE Code: ICT.GP.CPP.V22 ECTS credits: 3 Level: Bachelor's degree (full-time)

Course Title	Programming in C++
Type	Compulsory
Learning competences	
Learning outcomes	Nowadays the game industry mostly works with sophisticated game engines, like the CryEngine or the Unreal Engine. To add functionality to the Unreal Engine, you have to program in C++. C++ is a widely-used programming language that is used in the gaming industry as well as in many other industries. C++ is different from programming languages

	like Java or C#, mainly because you are responsible for your own memory management. You will learn C++ Programming in a Windows environment.		
Course content	• Introduction C++ • Classes in C++ • Object orientation in C++ • Templates • STL Classes (IO streams, vectors, etc.) • Pointers & references • Usage of C++ in a Windows environment		
Planned learning activities and teaching methods	• Lectures • Labs • Assignments		
Recommended or required reading and other learning resources / tools	• Visual Studio 2015 • See "Electronic Learning Environment" (ELO)		
Prerequisites and co-requisites	You are required to have English-language skills at B2 level and at least 120 ECTS credits in Computer Science or Software Engineering. Experience in C# and/or Java, algorithms and data structures, OO design and programming, UML and design patterns and software engineering practices is also necessary. When you apply for this programme, we will check if your current skills and knowledge match the requirements.		
Level	Advanced		
Grading scale	1 up to 10, 1 dec.		
Assessment methods and criteria	**Type of assessment**	**Grade weighting**	**Criteria**
	Lab exam	1	Higher or equal to 5.5
Language of Instruction	English		
Name of lecturer	For information about the lecturers you can contact Matthieu van Bekkum		
Mode of delivery	Face to face		