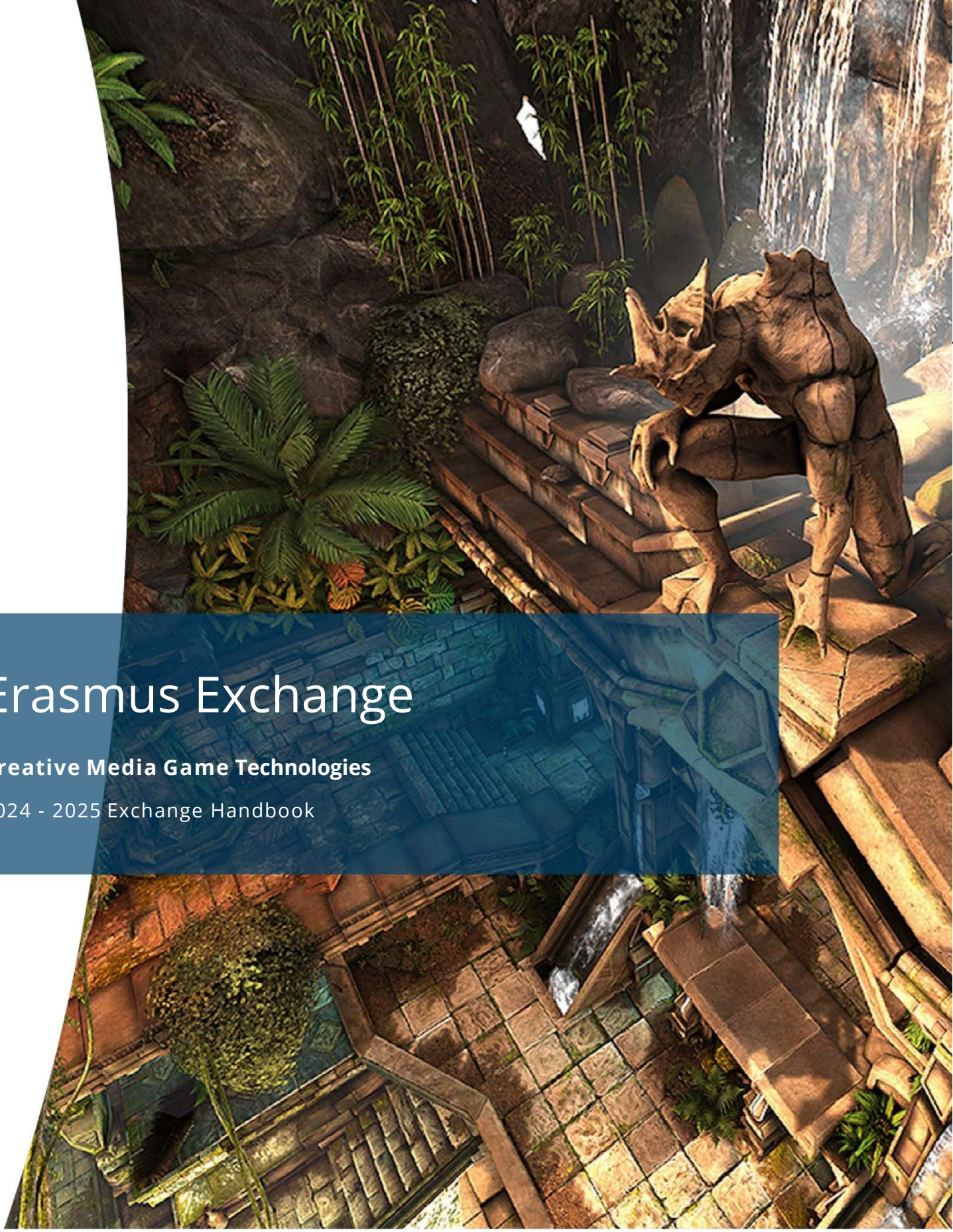

Erasmus Exchange

Creative Media Game Technologies

2024 - 2025 Exchange Handbook

Breda University
OF APPLIED SCIENCES

Introduction

Breda University of Applied Sciences consists of more than 7,000 students from over 100 countries. Our campus is situated in the south of the Netherlands, in the city of Breda, which is only 100 km from both Amsterdam and Brussels. Our institute, formerly known as NHTV Breda, was founded in 1966 as a provider of bachelor's courses in tourism and leisure, and in this field, it is currently the largest and leading education institute in the world. Today we offer degree programmes in the domains of Games, Media, Hotel, Facility, Logistics, Built Environment, Tourism and Leisure & Events.

Creative Media Game Technologies

The professional bachelor's programme of Creative Media and Game Technologies (CMGT) is taught in English entirely, preparing students for careers in the international AAA gaming industry. The programme has a practical orientation and is delivered by highly qualified and international lecturers with years of experience in the game development industry.

CMGT uses the Project-Based Learning (PBL) approach to education. In a simulated game studio - our Project Lab - students learn about concept development, game design, game architecture, game production, game business and marketing. In addition, students can choose from several workshops and lectures that match their interests and personal goals. Breda University of Applied Sciences is an official partner of Sony and is part of the PlayStation First Academic Development Programme. Furthermore, we are Houdini certified and collaborate with Ubisoft and Guerrilla Games.

Index

Course Program

This program focuses on the Project-Based Learning (PBL) system. Most of your time (four days per week) is spent working on projects. There are no 'traditional' classes or courses, but workshops and lectures, with guest lectures given on Fridays to support your project work. In addition, expert groups in various subjects and roles are organized on Fridays so that students can deepen their knowledge/skills in various subjects and contribute to the learning community. All workshops and lectures are open for all CMGT students to join so students are free to join any workshop which interests them.

Based on your prior knowledge gained at your home university, you continue your study path specifically in Visual Arts, Programming, Design & Production, or Visual Effects by choosing a role within a project and following one of these pathways. All communication and documentation at school is conducted in English. Information on the CMGT study paths can be found at www.buas.nl.

As part of the assessment and learning process, the students highlight project goals, deliver a learning journal and upload supporting project materials weekly. This learning journal consists of reflection from previous projects, project & personal goals, planning & scheduling, significant contributions on the project, a work log and highlights feedback the student has received throughout the project. The learning journal and supporting evidence are the main deliverables for the courses and is used to assess if the student has met the criteria set in the project brief and measure how well they have achieved the intended learning outcomes for each project.

The assessment is done "behind closed doors" by the teaching team and students are encouraged to fill in a self-assessment to detail their views on their performance for each of the Intended Learning Outcomes (ILO). Students are assessed on an individual basis even when working in teams. The project lab supervisors offer continual feedback throughout the block to assist students in achieving their goals and meeting the requirements of the projects. Attendance is mandatory on project lab days and students will be given time for self-study activities. Every project must be passed with a sufficient grade (5.5) to obtain the study credits.

1.1 Semesters and Arrival date

At CMGT, the first semester (fall) consists of blocks A and B, while the second semester (spring) consists of blocks C and D. Each block has eight project weeks, one assessment week and one re-assessment week for a total of 10 weeks.

When visiting for an exchange in the fall semester, classes commence in the first week of September. When visiting for an exchange in the spring semester, classes commence in the beginning of February (exact dates are dependent on the calendar year).

Date	Activity
August 26 – August 30	Introduction Week
September 2 – September	Start Semester 1
October 21 – October 25	Autumn Holiday
December 23 – January 3	Christmas Holiday
February 10 – February 14	Start Semester 2
March 3 – March 7	Spring Holiday
April 28 – May 2	May Holiday
July 7 – July 11	Final Week

Table 1 2024-2025 Academic Year

1.2 Laptop specifications

You can find the most recent laptop specification here: https://bit.ly/3mS36Kx

We try to keep this document up to date, but it is only intended to give you a general idea of what kind of laptop you should expect to have when joining our programme. Not everyone can afford a laptop that meets all these specifications, but there are three things you want to consider when purchasing a new laptop:

1. **CPU**: Get the best one you can afford. We generally work on Windows PC's with Intel CPU's. Try to get the latest generation of CPU (currently 13th generation Intel i7 or i9)
2. **GPU**: Get the best one you can afford. We generally work with NVIDIA GPU's. Try to get the latest generation of GPU (currently NVIDIA RTX 4070, 4080, 4090)
3. **RAM**: This is one of the most important components. Always get as much RAM as you can afford. The speed of the RAM is less important than the amount of RAM that your computer needs to keep running smoothly. We recommend at least 32GB of RAM.

With these three important components considered, the other features/specifications will likely fall into place.

If you prefer AMD over Intel/NVIDIA, then this is fine too, but please make sure you get an equivalent CPU/GPU as to what is described here. The laptops that the teaching staff use are Intel/NVIDIA so if you have a laptop that matches this specification, then you can be sure that if your project works for you, it will *probably* work for us too.

1.3 Curriculum Overview

Creative Media and Game Technology is a 4-year degree programme. Each year consist of 4 10-week blocks. Each block consists of 15 EC and requires approximately 420 hours (according to the European Credit Transfer System). Upon successful completion of the block, you receive 15 EC. There are no partial credits per block: it's 15 EC or nothing.

			Fall		Spring	
Year	**Course Code**	**Course Name**	**Block A**	**Block B**	**Block C**	**Block D**
1	FGA1.P1-02	Project 1.1 Foundation 1	15 ECTS			
	FGA1.P2-02	Project 1.2 Foundation 2		15 ECTS		
	FGA1.P3-02	Project 1.3 Foundation 3			15 ECTS	
	FGA1.P4-02	Project 1.4 Foundation 4				15 ECTS
2	FGA2.P1-02	Project 2.1 Exploration 1	15 ECTS			
	FGA2.P2-02	Project 2.2 Exploration 2		15 ECTS		
	FGA2.P3-02	Project 2.3 Exploration 3			15 ECTS	
	FGA2.P4-02	Project 2.4 Exploration 4				15 ECTS
3	FGA3.P1-02	Project 3.1 Collaboration 1	15 ECTS			
	FGA3.P2-02	Project 3.2 Collaboration 2		15 ECTS		
	FGA3.P3-02	Project 3.3 Collaboration 3			15 ECTS	
	FGA3.P4-02	Project 3.4 Collaboration 4				15 ECTS

Table 2 Curriculum Overview

1.1.1 What courses/project can you take

An exchange student may choose from the projects of year 1, 2 or 3, but must stay within the year they have chosen. This will be agreed upon in consultation with the BUas Exchange coordinator.

1.4 Courses/Projects

1.1.2 Year 1 - Foundation

The first year consists of 4 project blocks focused on developing student's *foundational skills*. The final block is a collaborative team project consisting of programmers, designers, producers, and artists. All blocks consist of tightly defined projects to build your knowledge and skills and are supported by lectures and workshops.

Project 1.1 - Foundation 1 (Variation Specific)

- Visual Art - Computer Graphics Fundamentals

The first Visual Arts project will enable students to become familiar with navigation within the Maya working environment. Students will learn basic modelling and texturing tools, and how these tools affect modelling and texturing decisions. Students who successfully complete this project will be able to perform most basic tasks within Maya at a proficient level. Visual Arts students will also attend (technical) drawing workshops for the purpose of improving their visual literacy.

- Programming - 2D Retro Game Programming

Your first project is to reproduce a classic arcade game like Galaxians, Gauntlet, or a 2D top-down RTS game. The purpose is to allow you to demonstrate your problem-solving skills, demonstrate your knowledge of C++ and become more familiar with use the Visual Studio integrated development environment (IDE), and provide a platform to use and learn source control systems. When you complete the project, you can further expand and evolve the project with a list of features, and we will guide you towards a better understanding of game programming.

- Design & Production - Game Design

In this project, students are tasked to create multiple instances of lo-fi prototypes demonstrating game mechanics intended to produce a given game dynamic. At the end of the project, you should be able to pitch a new game featuring this dynamic and use your prototyping experiences to show examples of how this game would work.

Project 1.2 – Foundation 2 (Variation Specific)

- Visual Art - DRAW!

During this block, students will be given a variety of exercises that seek to improve their observation, drawing and composition skills. These fundamental abilities constitute a skillset that any computer graphics artist should obtain, maintain, and develop further throughout their career. They are a necessary means to help describe ideas, visualize abstract concepts, and/or to communicate and inform other artists and developers on the team. For this project students will only be using traditional media.

- Programming – Raspberry Pi

During this block, you will be asked to produce a game using the Raspberry Pi as a target platform. You will be developing a 3D game during this block, using modern OpenGL ES with shaders for graphics and the Bullet library for physics. Quite a bit of mathematics is needed for the game. You will explore vector mathematics, including matrices. To accelerate development for the target platform we will also explore cross-platform development for Windows.

- Design & Production - Making A Game Your Own

In this project, you will take this experience and apply it in small groups to create a "Proof of Concept" for a platform game, which will feature 3 levels of action that should stand as examples of the gameplay that a larger project would feature. Engine: Unreal 4

Project 1.3 - Foundation 2 (Variation Specific)

- Visual Art - Animation and Tech Art Fundamentals

This project will introduce students to computer animation fundamentals. Students will first create a rough layout and animatic. They will finally animate a tank/robot and 3D scene according to this. Part of the project will introduce students to the fundamentals of rigging and automating repeating tasks by scripting and using procedural modelling.

- Programming - Ray Tracing

This block is focused on the Ray Tracing algorithm for rendering 3D graphics. We will explore physically based light transport and data structures for fast ray tracing. Since ray tracing is demanding for a CPU, we will pay special attention to software optimization. Recent research in the field is applied to make the renderer suitable for real-time games.

- Design & Production - Working for Clients

Students pitch games to client briefs, learning how to communicate ideas effectively, how to validate choices through research and rapid prototyping, and how to work within the constraints of a business environment.

Project 1.4 - Team Game Development (All variations together)

Students work in cross-disciplinary teams to develop a game using Unreal Engine, practising their skills on a real project and learning how to work on a small development team. This is an 'all-variations' block, but variation-specific challenges may apply.

1.1.3 Year 2 - Exploration

Year 2 provides the opportunity for students to explore several industry roles in team-based projects. Students may also experiment with moving across multiple variations. However, achieving a high level of expertise requires time and commitment, which is not achievable if a student changes roles or variations too often.

Project 2.1 - Exploration 1 (Variation Specific)

- Design & Production

Students in this project can choose between two roles: level design or system design. As level designers they learn about the level design pipeline and build a quake level in the Trenchbroom toolset. As system designers they deepen their skills in Blueprinting and develop and balance a top-down action game in Unreal Engine.

- Programming – Components of a game engine

Every student chooses between three modules (Engine & Tools, Graphics, AI & Physics) to develop themselves further in a specific programming role. Each module is supported by lectures and led by an expert teacher. The main goals of this block are to deeply understand the concepts and technology involved in a certain role, to gain experience at programming that technology yourself, and to learn more about writing clean and efficient code. Near the end of the block, students can apply their own creativity and expand the project to their liking.

- Visual Art

Students will focus on developing their practical skills and knowledge further in choosing one of four areas:

environment, procedural, character or animation & rigging. The final aim is game-ready content presented in a game development context. On Tuesday's art students will develop practical skills in sculpting and SubD modelling.

Project 2.2 - Exploration 2 (Variation Specific)

- Design & Production

Students are asked to point at a feature/system/content from an existing game, analyse it, and rebuild it in Unreal as a complete "plug in" with how-to documentation and a demo level. By focussing on a single element in a game we will hone your knowledge about modularity and efficient pipelines.

- Programming – Create a tool/feature through self-study

Based on a "dream job" search, each student decides what skills/knowledge they want to obtain in the upcoming block and then writes a self-study project plan around it. The project output should be a production-ready tool or feature that can be embedded in (or combined with) other game technology. In weekly meetings, the student shows their project progress and receives feedback from teachers and peers. The focus of the block lies on writing and maintaining a study plan, researching and analyzing technical problems with minimal supervision, and profiling and optimizing code.

- Visual Art

Visual Arts students focus on researching one of the main areas of interest: environment / props, procedural, character or animation & rigging. They create a benchmark asset that is founded on research done on the subject. On Tuesdays art students will develop practical skills in texturing, materials, and lighting.

Project 2.3 - Exploration 3 (Variation Specific)

- Design & Production

Students are grouped into small teams and are tasked to explore creative briefs and come up with a game concept. While going through several workshops that teach creative ideation techniques they collaborate to design and prototype a single player game.

- Programming - Assemble a game engine together

Students form small teams of programmers to create a custom cross-platform game engine for a specific target genre, based on the work from Blocks A+B. The engine should run efficiently on PC and on a modern console (such as the PlayStation 5), and artists and designers should be able to work with it. To achieve this, students need to learn about engine design, testing, development toolchains, QA pipelines, and (most importantly) to effectively work together on a codebase. This block is separated into Scrum sprints; each team needs to decide on their features and priorities per sprint. Ideally, Block C ends with multiple engines that can be used in Block D.

- Visual Art

Visual artists are put in small teams balanced by their roles. They create a concept for a game or cinematic with the focus on creating an art vision. The end deliverable will be a prototype of the concept where the teams shows that it is capable to create a coherent shared vision. On Tuesdays art students will focus on various ideation and creativity strategies to enrich your concepting skillset.

Project 2.4 - Exploration 4 (All variations together)

In multidisciplinary teams, students work on a single game project developing team skills, project scoping, production pipelines and meeting project requirements. Choice of projects include any developed in the previous blocks. At the end of the block, you will have a game that will be published to a digital distribution platform (like buas.itch.io).

1.1.4 Year 3 - Collaboration

During the 3rd year of the Games degree programme, the students will work together in large, multi-disciplinary teams to create a game that will be released to a digital distribution platform (like Steam). This is a year-long project and requires all the knowledge and skills that have been developed in the previous two years of the study. It is extremely unlikely that an exchange student will succeed in the 3rd year unless they are coming from another university that focuses on triple-A game development. For this reason, accepting an exchange student into the 3rd year requires an interview and approval from the exchange coordinator.

Project 3.1 – Collaboration 1 (Concept)

The concept phase is about solid analysis, research, rapid prototyping, and creativity. This will result in a Proof of Concept which is the first phase of development and is primarily focused on establishing the "Vision" for the project. All important project decisions need to be justified. It's required to answer "high-level" research questions which will frame the development for the rest of the project, to ensure that we can answer "low-level" questions more efficiently in the following phases. It is during this phase we establish things like core gameplay, style, tone, technology, and audience.

Project 3.2 – Collaboration 2 (Pre-production)

All facets of development should ramp up into full swing in Block B. Taking the discoveries, decisions and plans made in concepting, your ambitious goal for the end of block B is one key representative part of the product that demonstrates the final quality of your project's gameplay, visuals, and technology. This will result in the final block delivery of the Steam Demo. It must be highly polished and give a good enough impression that the game deserves the audience's attention.

Project 3.3 – Collaboration 3 (Production)

During this phase the bulk of the game's content is built. This is where the nested game loops are added and the UI/UX is refined. Art and Audio will be refined, and the game will begin to lead to its conclusion. QA processes are in full swing and high priority bugs are being fixed quickly. At the end of this block, you are aiming to be feature complete.

Project 3.4 – Collaboration 4 (Release)

In the final block of the year, your project undergoes final polish, bug fixing, balance, and optimisations to get it ready to achieve a successful final release in week 6. Alongside this, regular updates and patches are delivered to your community resolving high priority issues and adding content where applicable. This week 6 launch window allows for the release of an emergency update after final release if needed, time for the team to reflect on the year, write and analyse in a post-mortem, prepare for playday and industry days. Also, it allows time for you to finalise your evidence for the year. If working on a console, teams are also required to make their content compliant to the licence holders Technical Requirements (TRC's).

Appendix 1 – Didactic Principles

The Project Lab occupies a central position within the study programme. Each Project Lab has a focus on the development of a project or game and within that, students define their role and development, both professionally and personally. This practical and applied approach is offered to students in all years of the study programme and trains students, to an ever-increasing degree, in complex skills, and relevant professionalism.

The following didactic principles underlie the in-school training company:

1. The Project Lab is the core building block of the programme in CMGT and forms the foundation of the curriculum.

2. Every year of study, each 10-week Project Lab is worth 15 EC must be completed by carrying out practice-oriented assignments where students take on various roles within the Project.

3. The Project Lab groups enable students to deepen their understanding of their acquired knowledge in a simulated professional environment. In this professional simulation students are expected to behave as professional employees. This means that they are expected to be present and actively engaged in the business during office hours and to take their share of responsibility for the quality of the professional processes and/or the final product during their presence.

4. All Project groups will be assisted by a year team. The team will provide individual support to team members in the various roles on the Project.

5. The Project will also be reviewed and evaluated from the Game/Product level by the year team. This can include external parties if involved such as an industry client for example.

6. Students will be assessed on their individual contribution to one (or more) projects during a block.

7. In case of absence due to (health) reasons, students are obliged to notify a student coach via e-mail or by phone before the start of the Project Lab (9:00 AM). In case of severe medical issues, the student needs to inform the student counsellor as soon as possible.

Games

Media

Hotel

Facility

Built Environment

Logistics

Tourism

Leisure & Events

Breda University
OF APPLIED SCIENCES

Mgr. Hopmansstraat 2
4817 JS Breda

P.O. Box 3917
4800 DX Breda
The Netherlands

PHONE
+31 76 533 22 03

WEBSITE
www.buas.nl

DISCOVER YOUR WORLD