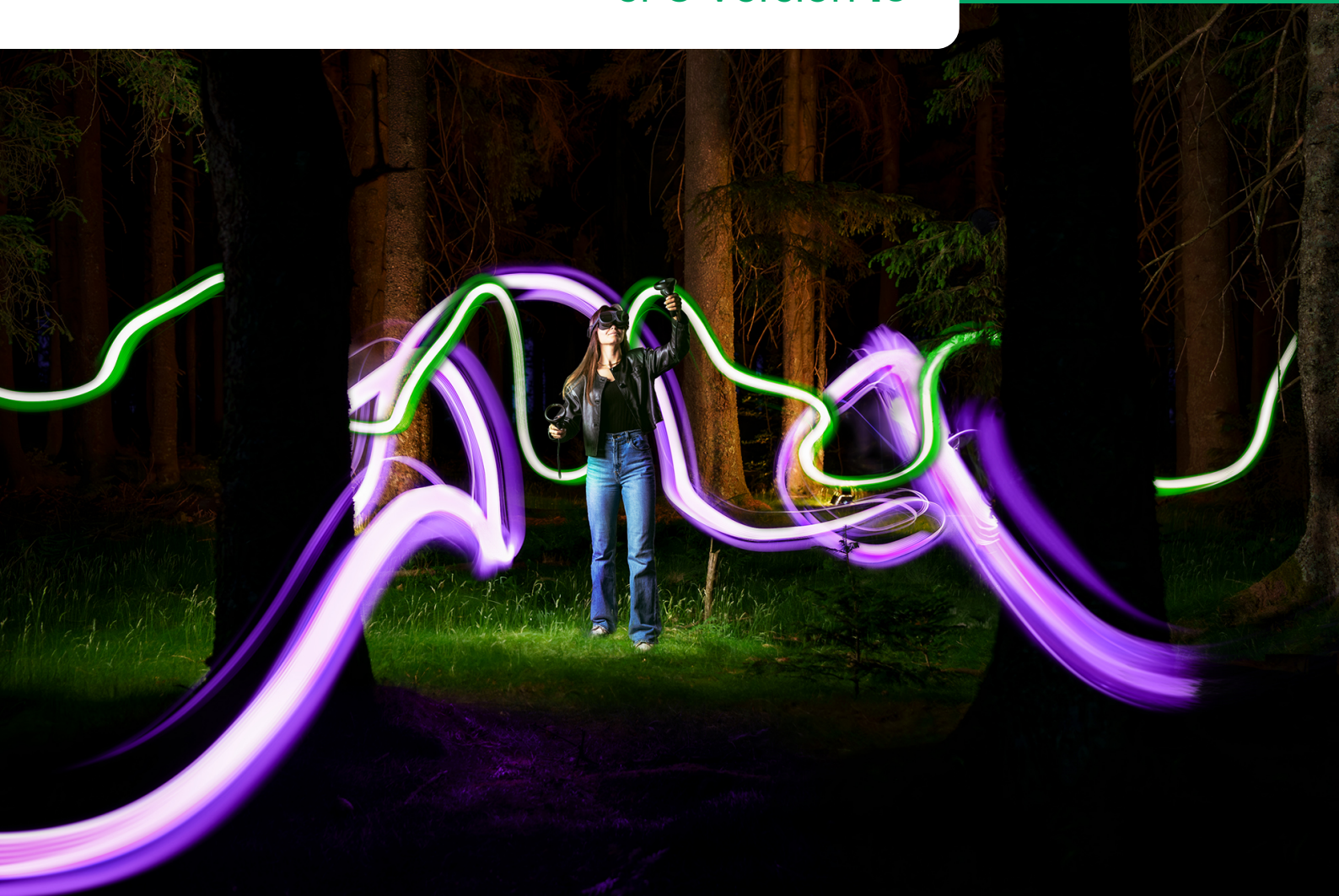


Module Manual

Games & Immersive Media

B.A.

SPO Version **10**



Academic Dean – Prof. Jirka Dell’Oro-Friedl

Fakultät Digitale Medien

Robert-Gerwig-Platz 1 – 78120 Furtwangen

§ 87 Bachelor Study Program – Games & Immersive Media

- (1) Der Gesamtumfang der für den erfolgreichen Abschluss erforderlichen Lehrveranstaltungen im Pflicht- und Wahlpflichtbereich einschließlich des Praktischen Studiensemesters beträgt 210 Leistungspunkte.
- (2) Im Studiengang Games & Immersive Medien umfasst das Grundstudium zwei Lehrplansemester, das Hauptstudium fünf Lehrplansemester.
- (3) Das fünfte Lehrplansemester ist Praktisches Studiensemester.
- (4) Bezüglich der Regelungen für Auslandsstudiensemester wird auf § 3a im Allgemeinen Teil der SPO verwiesen.
- (5) Der Wahlpflichtbereich dient zur selbstverantwortlichen Vertiefung und Erweiterung der Studieninhalte. Für den Wahlpflichtbereich (Electives) gelten folgende übergreifende Regelungen:
 - a) Im Hauptstudium sind insgesamt vier Wahlpflichtmodule (Elective 1-4) zu erbringen, welche die Themen des GMB-Studiums gezielt vertiefen. Die Fakultät Digitale Medien bietet regelmäßig vertiefende Wahlpflichtmodule und Einzelveranstaltungen an.
 - b) Lehrveranstaltungsangebote außerhalb der Fakultät Digitale Medien können ebenfalls angerechnet werden, sofern diese vom Studiendekan zugelassen wurden.
 - c) Jedes Wahlpflichtmodul muss einen Umfang von 6 Leistungspunkten haben. Mindestens die Hälfte der Leistungspunkte ist als Prüfungsleistung zu erbringen.
 - d) Zum Ende des Studiums können Studierende maximal zwei Wahlpflichtmodule aus bis dahin absolvierten Einzelveranstaltungen selbst zusammenstellen. Auch für diese sogenannten heterogenen Module gelten die hier genannten Regelungen.
- (6) Zeugnis und Urkunde werden in englischer Sprache ausgestellt.
- (7) Die für den erfolgreichen Abschluss des Studiums erforderlichen Lehrveranstaltungen im Pflichtbereich und die zugehörigen Studien- und Prüfungsleistungen ergeben sich aus Tabelle 2 für das Grundstudium und aus Tabelle 3 für das Hauptstudium. Tabelle 1 zeigt eine Übersicht zur Modulstruktur.

Table 1: Module Structure

Module / Semester	1	2	3	4	5
7	Elective 3	Elective 4	Thesis		
6	Elective 1	Elective 2	Business 2	Project 5	
5	Internship				
4	Code 4	Theory 3	Business 1	STEM 3	Project 4
3	Code 3	Sound 2	STEM 2	Visual 3	Project 3
2	Code 2	Theory 2	Sound 1	Visual 2	Project 2
1	Code 1	Theory 1	STEM 1	Visual 1	Project 1

Table 2: Games & Immersive Media B.A. (1-2 foundation level studies Curricular Semester)

Module	Event	Type	Contact Hours	Graded assessment	Non-graded assessment	Credit Points
1. Curricular Semester						30
Code 1 (6 CP)						
Code 1		S	4	1sbK		6
Theory 1 (6 CP) ⁽¹⁾						
Computer Science and HCI Theory		V/S	4	1sbK	1R	6
STEM 1 (6 CP)						
STEM 1 Seminar		S	3	1K		4
STEM 1 Practical		P	1		1sbA	2
Visual 1 (6 CP)						
Visual 1		S/P	4	1sbA		6
Project 1 (6 CP)						
Entry Project - No Code		W	4	1sbA		6

Module	Event	Type	Contact Hours	Graded assessment	Non-graded assessment	Credit Points
2. Curricular Semester						30
Code 2 (6 CP)						
Code 2		S/P	4	1sbK		6
Theory 2 (6 CP)						
Theory 2 - Game Design		S/P	2	1sbK		3
Theory 2 - Data Driven Game Design		S	2	1KO		3
Sound 1 (6 CP)						
Sound 1 - Basics of sound and music design		S	4	1sbA		6
Visual 2 (6 CP)						
Visual 2 - Game Asset Creation		S/P	4	1sbA		6
Project 2 (6 CP)						
Project 2 - Physical Game		W	3	1A		6
Overall						60

Table 3: Games & Immersive Media B.A. (3-7 advanced level studies Curricular Semester)

Module	Event	Type	Contact Hours	Graded assessment	Non-graded assessment	Credit Points
3. Curricular Semester						30
Code 3 (6 CP)						
Code 3 - Realtime Computer Graphics		S/P	4	1sbA		6
Sound 2 (6 CP)						
Sound 2 - Concepts and techniques in interactive and immersive audio design		S/P	4	1sbA		6

Module	Event	Type	Contact Hours	Graded assessment	Non-graded assessment	Credit Points
STEM 2 (6 CP)⁽¹⁾						
STEM 2		S	4	1sbK, 1sbA		6
Visual 3 (6 CP)						
Visual 3 - Game Character Design and Animation		S/P	4	1sbA		6
Project 3 (6 CP)						
Project 3 - Intermediate Digital Project		W	3	1A		6
4. Curricular Semester						30
Code 4 (6 CP)						
Code 4		S/P	4	1K		6
Theory 3 (6 CP)						
Theory 3		S	4	1sbK		6
Business 1 (6 CP)						
Business 1		S	4	1sbK		6
STEM 3 (6 CP)						
STEM 3 - Physical Computing		S/P	4	1sbA		6
Project 4 (6 CP)						
Project 4 - Advanced Digital Project		W	3	1A		6
5. Curricular Semester						30
Internship (30 CP)						
Internship					1sbA	28
Seminar Internship		S	1		1R	2

Module	Event	Type	Contact Hours	Graded assessment	Non-graded assessment	Credit Points
6. Curricular Semester						30
Elective 1 (6 CP)						
	Elective Course (WPM) see (5)			PL	SL	6
Elective 2 (6 CP)						
	Elective Course (WPM) see (5)			PL	SL	6
Business 2 (6 CP)						
	Business 2	S	4	1sbK		6
Project 5 (12 CP)						
	Project 5 - Complex Digital Project	W	3	1A		12
7. Curricular Semester						30
Elective 3 (6 CP)						
	Elective Course (WPM) see (5)			PL	SL	6
Elective 4 (6 CP)						
	Elective Course (WPM) see (5)			PL	SL	6
Thesis (18 CP)						
	Bachelor thesis			1T		12
	Thesis Seminar	S	2		1PN	6
Overall						150

⁽¹⁾ Die gesamte Prüfungsleistung ist nur bestanden, wenn alle Teil - Prüfungsleistungen mit mindestens "ausreichend" (4,0) bewertet werden. Im Fall des Nichtbestehens müssen und dürfen nur die nichtbestandenen Teil - Prüfungsleistungen wiederholt werden.

Code 1

Module code:	Workload:	Credits:	Semester:	Repetition:	Duration:
DM-2023-2808	180 h	6	1	SoSe	1

Event:	Language:	Contact Time:	Self Study:	Groupsize:
a) Code 1	German / English	4 SWS / 45h	135h	35

► Learning outcomes:

After successfully completing the module, students will be able to

Knowledge

- ◆ know the basic concepts of interactive audio-visual applications.

Understanding

- ◆ understand basic information structures for interactive 2D-graphics and audio as implemented by web-technologies.

Practical Use

- ◆ work with a programming language and use software development and source control environments.

Analysis

- ◆ analyse simple human-computer-interactions and use computational thinking to formulate algorithms for their realization

Synthesis

- ◆ be creative and experiment with procedural coding, web- and other technologies

Evaluation

- ◆ evaluate and improve their coded creations

► Content

a) Code 1

- ◆ Creative Code
- ◆ Web Fundamentals
- ◆ 2D-Scenograph
- ◆ Procedural Code
- ◆ Coding Audio-Visuals
- ◆ Computational Thinking

► Teaching methods

a) Code 1

- ◆ Seminar

► Prerequisites

a) Code 1

- ◆ None

► Methods of assessment

a) Code 1

- | | | |
|--|-------------|------|
| ◆ Written exam set during the course (sbk) | <i>Exam</i> | 6 CP |
|--|-------------|------|

► Applicability of module

Required module in:

- ◆ Games & Immersive Media B.A. (SPO-Version: 10)

► Person responsible for module / lecturer

Person responsible for module:

- ◆ Prof. Jirka Dell’Oro-Friedl

Full-time lecturers:

a) Code 1

- ◆ Prof. Jirka Dell’Oro-Friedl

► Literature

a) Code 1

- ◆ Robbins, Jennifer: HTML5 pocket reference, Sebastopol, CA: O’Reilly, 2013
- ◆ Meyer, Eric A.: CSS pocket reference, Sebastopol, CA: O’Reilly Media, 2018
- ◆ Vanderkam, Dan: Effective TypeScript. Sebastopol, CA: O’Reilly Media, 2019

Project 1

Module code:	Workload:	Credits:	Semester:	Repetition:	Duration:
DM-2023-2807	180 h	6	1	SoSe	1

Event:	Language:	Contact Time:	Self Study:	Groupsize:
a) Entry Project – No Code	German / English	4 SWS / 45h	135h	20

► Learning outcomes:

After successfully completing the module, students will be able to

Knowledge

- ◆ specify the basics of agile projects.
- ◆ specify the basics of agile learning.

Understanding

- ◆ understand the benefits of agility.
- ◆ understand the basics of No-Code/Low-Code game development.

Analysis

- ◆ reflect their personal skills for team projects.

Synthesis

- ◆ present their results to an audience.
- ◆ develop a simple computer game in a playful approach.

Evaluation

- ◆ understand the impact of following courses.
- ◆ evaluate the limitations of No-Code/Low-Code game development.

► Content

a) Entry Project - No Code

- ◆ No-Code/Low-Code game project
- ◆ Agile mindset
- ◆ Project-based learning
- ◆ Methods (Scrum, Kanban, Team Building)
- ◆ Game design documents
- ◆ Developing a simple computer game
- ◆ Presentation and event planning

► Teaching methods

a) Entry Project - No Code

- ◆ Project

► Prerequisites

a) Entry Project - No Code

- ◆ None

► Methods of assessment

a) Entry Project - No Code

- ◆ Practical assignment set during the course (sbA) *Exam* 6 CP

► Applicability of module

Required module in:

- ◆ Games & Immersive Media B.A. (SPO-Version: 10)

► Person responsible for module / lecturer

Person responsible for module:

- ◆ Prof. Nikolaus Hottong

Full-time lecturers:

a) Entry Project – No Code

- ◆ Prof. Nikolaus Hottong
- ◆ Prof. Dr. Uwe Hahne

► Literature

a) Entry Project – No Code

STEM 1

Module code:	Workload:	Credits:	Semester:	Repetition:	Duration:
DM-2023-2809	180 h	6	1	SoSe	1

Event:	Language:	Contact Time:	Self Study:	Groupsize:
a) STEM 1 Seminar	German / English	3 SWS / 33.75h	90h	35
b) STEM 1 Practical	German / English	1 SWS / 11.25h	45h	20

► Learning outcomes:

After successfully completing the module, students will be able to

Knowledge

- ◆ reliably reproduce central basic concepts of projection (set theory).
- ◆ know how to articulate geometric questions precisely using the appropriate technical terms.

Understanding

- ◆ recognise, understand and reproduce, meaningful connections and proof elements or derivations in the field of geometry and the mapping of three-dimensional objects on two-dimensional planes.

Practical Use

- ◆ apply techniques of vector calculus and matrix algebra to geometrical problems and to questions of the position and representation of spatial objects.

Analysis

- ◆ analyse geometric problems in the plane and space, while selecting the appropriate tools from those provided.

Synthesis

- ◆ recognise and exploit common structures and patterns in different mathematical areas.
- ◆ present an overview of a suitable delimited model relevant to computer graphics or computer vision.

Evaluation

- ◆ weigh up different procedures (e.g., for linking affine or projective transformations) in terms of clarity and effort.

► Content

a) STEM 1 Seminar

- ◆ Coordinates of Points and Vectors, Change of Coordinate Frames
- ◆ Systems of Linear Equations
- ◆ Metric Spaces: Distances, Lengths, Angles
- ◆ Matrices, Linear and Affine Transformations
- ◆ Homogeneous Coordinates
- ◆ Parallel, Axonometric and Orthographic Projections
- ◆ Linear Perspective: Image Construction using Desargues' Theorem
- ◆ Points at Infinity and Vanishing Points
- ◆ Projection Matrices: Unified Approach
- ◆ Camera Models in Computer Graphics and Computer Vision

b) STEM 1 Practical

- ◆ All contents of course a) are applied and practised.

► Teaching methods

a) STEM 1 Seminar

- ◆ Seminar

b) STEM 1 Practical

- ◆ Practical/lab

► Prerequisites

a) STEM 1 Seminar

- ◆ None

b) STEM 1 Practical

- ◆ None

► Methods of assessment

a) STEM 1 Seminar

- ◆ Written exam (K) *Exam* 4 CP

b) STEM 1 Practical

- ◆ Practical assignment set during the course (sbA) *Study Task* 2 CP

► Applicability of module

Required module in:

- ◆ Games & Immersive Media B.A. (SPO-Version: 10)

► Person responsible for module / lecturer

Person responsible for module:

- ◆ Prof. Dr. Thomas Schneider

Full-time lecturers:

a) STEM 1 Seminar

- ◆ Prof. Dr. Thomas Schneider

b) STEM 1 Practical

- ◆ Prof. Dr. Thomas Schneider

► Literature

a) STEM 1 Seminar

- ◆ Anton, H.; Rorres, C.; Kaul, A.: Elementary Linear Algebra, Applications Version
- ◆ Lengyel, E.: Mathematics for 3D Game Programming and Computer Graphics

b) STEM 1 Practical

- ◆ See course a)

Theory 1

Module code:	Workload:	Credits:	Semester:	Repetition:	Duration:
DM-2023-2810	180 h	6	1	SoSe	1

Event:	Language:	Contact Time:	Self Study:	Groupsize:
a) Computer Science and HCI Theory	German / English	4 SWS / 45h	135h	35

► Learning outcomes:

After successfully completing the module, students will be able to

Knowledge

- ◆ have basic knowledge in HCI including cognition and perception, UCD and UCD Process.
- ◆ have basic knowledge on computer hardware, concepts and history of computer science.

Understanding

- ◆ understand concepts in computer science like computer architecture, bits & bytes.
- ◆ understand user-centred, psychological and HCI concepts.

Practical Use

- ◆ apply computer science concepts.
- ◆ apply user-centred design, UI design concepts.

Analysis

- ◆ analyse programs / code for concepts.
- ◆ analyse user interfaces for patterns and interaction concepts

Synthesis

- ◆ design and create interactions and user interfaces.
- ◆ realize basic algorithms / programs.

Evaluation

- ◆ evaluate user interfaces using heuristics and design principles.
- ◆ evaluate code for programming principles.

► Content

a) Computer Science and HCI Theory

- ◆ Why computer science?
- ◆ Current research and technology
- ◆ History of the computer
- ◆ Technology hardware, von NeumannComputer
- ◆ Science basics: Bits & Bytes, pixels
- ◆ Boolean logic
- ◆ Perception (Visual, auditive and haptic), including colours
- ◆ Cognition and memory, HCI topics
- ◆ User-centred design and user-centred design process

► Teaching methods

a) Computer Science and HCI Theory

- ◆ Lecture (V) / Seminar (S)

► Prerequisites

a) Computer Science and HCI Theory

- ◆ None

► Methods of assessment

a) Computer Science and HCI Theory

- | | | |
|---|-------------------|------|
| ◆ Written exam set during the course (sbk) | <i>Exam</i> | 3 CP |
| ◆ Presentation with a written component (R) | <i>Study Task</i> | 3 CP |

► **Applicability of module**

Required module in:

- ◆ Games & Immersive Media B.A. (SPO-Version: 10)

► **Person responsible for module / lecturer**

Person responsible for module:

- ◆ Prof. Dr. Thomas Schlegel

Full-time lecturers:

a) Computer Science and HCI Theory

- ◆ Blanche Schoch

► **Literature**

a) Computer Science and HCI Theory

- ◆ Will be given in lecture as applicable

Visual 1

Module code:	Workload:	Credits:	Semester:	Repetition:	Duration:
DM-2023-2811	180 h	6	1	SoSe	1

Event:	Language:	Contact Time:	Self Study:	Groupsize:
a) Visual 1	German / English	4 SWS / 45h	135h	20

► Learning outcomes:

After successfully completing the module, students will be able to

Knowledge

- ◆ gain knowledge of and practice the essential basics of visual design.

Understanding

- ◆ understand artistic processes and assess composition and design.

Practical Use

- ◆ develop and implement design concepts.

Analysis

- ◆ break down creative processes, analyse design parameters and visualize production processes.

Synthesis

- ◆ combine creative processes to create coherent design concepts for immersive media.

Evaluation

- ◆ iterative evaluation of own work and implementation of visual adjustments.

► Content

a) Visual 1

- ◆ Draft and sketching
- ◆ Figurative thinking
- ◆ Storyboard
- ◆ Colour theory and practical application
- ◆ Visual character-development
- ◆ UI design basics

► Teaching methods

a) Visual 1

- ◆ Seminar / Practical/lab

► Prerequisites

a) Visual 1

- ◆ None

► Methods of assessment

a) Visual 1

- ◆ Practical assignment set during the course (sbA) *Exam* 6 CP

► Applicability of module

Required module in:

- ◆ Games & Immersive Media B.A. (SPO-Version: 10)

► Person responsible for module / lecturer

Person responsible for module:

- ◆ Prof. Christian Fries

Full-time lecturers:

a) Visual 1

- ◆ Prof. Christian Fries
- ◆ Alexandra Junge

► Literature

a) Visual 1