University of Gdańsk

Subject card

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| Subject name and code | Video Game Engine, PG_00216099 | | | | | | |
| Field of study | Historical Games and Digital Heritage | | | | | | |
| Date of commencement of studies | October 2027 | | Academic year of realisation of subject | 2027/2028 | | | |
| Education level | Master's studies | | Subject group | Obligatory subject group in the field of study | | | |
| Mode of study | full-time studies | | Mode of delivery | e-learning | | | |
| Year of study | 1 | | Language of instruction | English | | | |
| Semester of study | 1 | | ECTS credits | 4.0 | | | |
| Learning profile | academic | | Assessment form | credit | | | |
| Conducting unit | | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | | | | | |
| | Teachers | | | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 0.0 | 0.0 | 30.0 | 0.0 | 0.0 | 30 |
| | E-learning hours included: 30.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | Self-study | | SUM |
| | Number of study hours | 30 | | 30.0 | 40.0 | | 100 |
| Subject objectives | The course develops practical competencies in using game engines to create simple interactive experiences based on historical and cultural material. Students learn the fundamental structure and functions of a game engine, including scene creation, asset management, interaction implementation and prototype testing. The course strengthens their ability to select appropriate tools and translate design concepts into functional digital experiences, considering technical constraints, historical representation and responsible asset use. | | | | | | |

| Learning outcomes | Course outcome | Subject outcome | Method of verification |
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| | [GHDCMU2_W03] Has an in-depth knowledge and understanding of the principles and methods of iterative game design and prototyping, particularly historical games as interactive models of the past informed by historical knowledge and source interpretation, and culturally themed games as forms of engagement with cultural heritage. | Explains the structure and fundamental functions of a game engine, including scenes, objects, components, assets and interaction logic, and their role in implementing and iteratively developing game prototypes. | [SW2] presentation/project/paper/ report<br>[SW5] implementation of a problem task |
| | [GHDCMU2_K04] Is prepared to responsibly fulfil professional roles as a researcher, creator or consultant, to uphold and promote the principles of professional ethics, and to require others to adhere to them, while maintaining academic integrity, professional standards of conduct and social sensitivity when working with historical and cultural materials. | Demonstrates professional and ethical responsibility by documenting asset provenance, respecting intellectual property rights and identifying historical simplifications and representational limitations in the developed prototype. | [SK6] demonstration of practical skills |
| | [GHDCMU2_U03] Independently develops and refines design solutions in the creation of games focused on history and cultural heritage, drawing on historical knowledge and critical source analysis, selecting appropriate methods and tools during concept development, prototyping, playtesting and iterative refinement, and collaborating within an interdisciplinary team to prepare the outcomes for dissemination to audiences. | Creates and modifies a simple, functional historical game prototype in a selected game engine, implementing basic controls, interactions and feedback, and refining the prototype in response to testing. | [SU6] demonstration of practical skills |
| | [GHDCMU2_U04] Independently selects, applies and adapts digital tools and methods for the analysis, documentation and interpretation of cultural heritage and for addressing complex problems related to researching and presenting the past, developing new solutions while taking into account project objectives, the quality of historical sources and data, technological capabilities and limitations, and requirements concerning the accessibility of the results. | Selects and applies game engine features and digital assets appropriate to a historical game or digital heritage project, considering their capabilities, technical limitations and basic accessibility requirements. | [SU5] implementation of a problem task<br>[SU6] demonstration of practical skills |

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| Subject contents | 1. Game engine functions and architecture; comparison of Unity, Godot and Unreal Engine and tool selection criteria.<br>2. Editor workflow: project structure, scenes, objects, components and hierarchies.<br>3. Importing 2D/3D assets, file organisation, materials and asset licensing.<br>4. Basic interaction logic: player input, events, collisions, triggers and simple scripts or visual scripting.<br>5. User interface, feedback, camera, lighting and audio fundamentals.<br>6. Translating selected historical material into an interactive scene and player decisions.<br>7. Playtesting, debugging, prototype revision and basic accessibility.<br>8. Running and documenting a micro-prototype; explaining technical choices and the limits of historical representation.<br><br>Practical work uses one game engine announced before the course begins. |
| Prerequisites and co-requisites | |

Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Historical Game Engine Micro-Prototype | 51.0% | 80.0% |
| active participation in classes, engagement in exercises and problem-solving tasks | 51.0% | 20.0% |

Recommended reading

Basic literature

1. Bond, J. G. (2022). *Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C#*. 3rd ed. Addison-Wesley Professional. Selected chapters on Unity workflows, prototyping and implementation.
2. Hardman, C. (2024). *Game Programming with Unity and C#: A Complete Beginner's Guide*. Apress. Selected introductory chapters.
3. Hanes, L. and Stone, R. (2019). 'A model of heritage content to support the design and analysis of video games for history education'. *Journal of Computers in Education*, 6, 587–612. https://doi.org/10.1007/s40692-018-0120-2
4. Official technical documentation and introductory tutorials for the game engine selected for the course (Unity, Godot or Unreal Engine), using the version adopted for teaching.

Supplementary literature

1. Chapman, A. (2016). *Digital Games as History: How Videogames Represent the Past and Offer Access to Historical Practice*. Routledge.
2. McCall, J. (2020). 'The Historical Problem Space Framework: Games as a Historical Medium'. *Game Studies*, 20(3).
3. Petridis, P., Dunwell, I., Panzoli, D., Arnab, S., Protopsaltis, A., Hendrix, M. and de Freitas, S. (2012). 'Game Engines Selection Framework for High-Fidelity Serious Applications'. *International Journal of Interactive Worlds*, 2012, Article 418638. https://doi.org/10.5171/2012.418638

eResources addresses

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| Example issues/ example questions/ tasks being completed | Playtest the prototype, identify problems and implement improvements. |
| Work placement | Not applicable |

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