

## Some guidelines / topics for studying for the exam

- What are major events in the development of XR both theoretical and practical
  - While challenging, what are definitions of the main ideas
    - On the theoretical side we have concepts such as immersion (technical reading), presence, interaction, agency, paradigm shift
    - On the practical side, we have technology that is characterized by the reality-virtuality continuum.
    - What is a digital twin?
  - What is the difference between the original reality-virtuality continuum by Milgrim and Kishino and the revised proposal by Flavian et al. 2019
  - What is the difference between internal and external devices according to Flavian et al. 2019
  - What is the EPI cube (explain its axes) and how can it be used to categorize technologies
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- What is design thinking?
  - What are the five stages of design thinking according to the Stanford d.school of design?
  - What happens in each of the five stages?
  - What, in particular, is ideation and what are we using it for?
  - Gamestorming offers many valuable methods for developing immersive designs. Can you explain the 3-12-3 methods, what affinity mapping is and how you could use role play in the design process?
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- Evaluation is a central aspect of every design. What do we mean by the scientific method?
  - What are Peirce's methods of "fixing beliefs"?
  - What are examples of methods of how we can systematically evaluate immersive experiences?
  - What are physiological signals?
  - What is the system usability scale?
  - How do we measure presence?
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- What are data types typically used in ArcGIS Maps SDK for Unity?
  - What are the names of different ArcGIS data layers available in ArcGIS Maps SDK for Unity? How do they look like in the Unity scene?
  - Understand the meaning of isovist in architectural design.
  - Understand the meaning of LiDAR point clouds.
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- What does the term "sense of place" mean? How does XR contribute to place-based education?

- What does the theory of embodied cognition propose?
  - Spatial presence is the sense of physically being in an XR environment. What are the different stages of the two-level model as proposed by Wirth et al. (2007)? How can they be used to explain the formation of spatial presence?
  - Cognitive load theory proposes three types of load: intrinsic, germane, and extraneous. Why is it important to consider cognitive load in the design and development of XR applications?
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- What is MARIN?
  - Why are they interested in immersive technologies?
  - What is the Seven Ocean Simulator Center?
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- What is TNO?
  - What is TNO's vision for immersive technologies?
  - What are TNO's ethical considerations regarding immersive technologies?
  - What is TNO's vision for the future of human connection?
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- Consider the differences between bottom-up and top-down modelling (Is it also possible to visualise this process using a diagram?)
  - We covered several basic texturing layers, it's good to understand the difference(s) between them.
  - What is key for 3D animation and how do we set up a character for animating?
  - Understand horizontal and vertical movement in Unity
  - How should we consider the structure of a virtual 3D environment?
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- Remember the primitive object types that can be created directly within Unity
  - Understand the difference between Edit Mode and Play Mode inside the Unity editor.
  - Understand the difference between Start() and Update() functions in a C# script.
  - Understand why use prefabs in Unity.
  - Know how to toggle the visibility of a GameObject from the script in Unity
  - Know how to apply force to an object in Unity
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- Photogrammetry
    - Basics of camera setting
    - Basics of software used for photogrammetry
  - What is a digital twin, what can you do with it
  - How are digital twins connected to XR