University Politehnica of Bucharest – Romania
Reykjavik University - Iceland
Faculty of Medical Engineering

Virtual reality in cell stem-curriculum

- Introduction to Virtual Reality and Cell Stem
  - Introduction to the course and learning objectives
  - Overview of Virtual Reality technology and its applications in scientific research
  - Introduction to stem cells and their role in biology and medicine

- Basics of VR Development
  - Introduction to VR development platforms and tools
  - Hands-on experience with VR hardware and software
  - Creating a simple VR environment using a development platform

- Cellular and Molecular Processes
  - Review of cellular structures and organelles
  - Cellular signalling pathways relevant to stem cells
  - Understanding gene expression and regulation in stem cells

- VR Visualization of Cellular Structures
  - Creating 3D models of cells, organelles, and molecular structures
  - Texturing, lighting, and animation techniques for VR visualization
  - Designing interactive VR experiences of cellular structures

- Stem Cell Niches in Virtual Reality
  - Modelling and simulating stem cell microenvironments in VR
  - Understanding the importance of stem cell niches in stem cell biology
  - Exploring cell-cell and cell-niche interactions in VR environments

- VR Simulations of Stem Cell Differentiation
  - Creating interactive simulations of stem cell differentiation pathways
  - Visualizing molecular signalling and regulatory networks in VR
  - Exploring various factors influencing stem cell fate decisions

- VR Applications in Regenerative Medicine
  - Investigating tissue regeneration and angiogenesis in VR environments
  - Designing VR-based therapies and interventions for regenerative medicine
  - Exploring the potential of stem cells in tissue engineering

- Team Projects: VR in Cell Stem
  - Forming teams to work on collaborative VR projects
  - Identifying specific topics or challenges related to stem cell biology
  - Designing, developing, and refining VR experiences for Cell Stem applications

- Project Presentation and Reflection
  - Finalizing VR projects and preparing presentations
  - Presenting VR projects to the class and receiving feedback
  - Reflecting on the learning outcomes and potential future directions of VR in Cell Stem

The financial support provided by Education, Scholarships, Apprenticeships and Youth Entrepreneurship Programme in Romania, financed by the EEA Grants 2014-2021, Cooperation Projects in Higher Education Area, project Mixed Reality e-learning platform dedicated to Medical Engineering (REALME), contract RO-EDUCATION-0177 / 21-COP-0017