THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Virtual Reality

CSE 5546

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Principles and methods for the design, development, and evaluation of three-dimensional interfaces in virtual environments and their applications in data science, medicine, and engineering.

Prerequisites and Co-requisites:
Prereq: 3541, 5541, 5542, or 5544, or permission of instructor.

Course Goals / Objectives:
- Master fundamental 3D interfaces theory including software and hardware technologies (CAVE, head-mounted display, google cardboard), 3d interaction techniques (navigation, manipulation, system control, and symbolic input) and evaluation methods.
- Be competent with applying the key principles and techniques learned in the class to solve real-world problems.
- Be competent with design principles of creating interaction techniques.
- Be competent with creation of interactive visualization in immersive settings
- Be familiar with utilizing hardware characteristics (stereo, head-tracking) in design.
- Be familiar with interdisciplinary research methods.
- Be familiar with software packages.
- Be exposed to original research and applications in virtual reality.

Course Topics:

- Background in virtual reality and virtual environments
- Input devices: Wands, 3D mouse
- Output devices: HMD, CAVE, fishtank, CAVE2, ImmersaDesk
- Immersion and presence: Stereo, head-tracking
- Real-time graphics: Rendering and visualization
- Augmented and mixed reality
- Navigation: Travel and way finding in 3D
- Selection and manipulation of objects in 3D
- System control: Change of system state in 3D
- Analytical tasks
- Evaluation and validation techniques
- Software development
- The future of VE

Designation:

Elective