VIRTUAL TECHNOLOGY/ DESIGN (VTD)

VTD 1010 Introduction to Virtual Reality (3 credits)
This course explores introductory design methods, history, and theory of virtual reality (VR). Within this context we will explore the technical application of VR in the fields of medicine, engineering, education, design, art, simulation, training, and entertainment. This course is designed to allow students the ability to develop their cognitive sensibilities, and technical design skills required to produce VR experiences. Each week the course will build off student lead projects and assigned exercises that will explore the fundamentals of VR. During the first half of the course students will explore the modern construct of "virtual", with the second half of the class dissecting the philosophical human perception of "reality" itself. Typically Offered: Fall and Spring.

VTD 1510 Virtual World Building 1 (2 credits)
Introduction to the processes and principles of design associated with virtual world building. Two 2-hour lectures per week and assigned work. Typically Offered: Fall.

VTD 1520 Virtual World Building 2 (2 credits)
Applied tools and techniques. Exploration of the processes and principles of design associated with virtual building. Two 2-hour lectures per week and assigned studio coursework. Typically Offered: Fall.
Coreqs: VTD 1510

VTD 1530 Virtual World Building 3 (2 credits)
Intermediate level virtual world building with an emphasis on intermediate-level tools and techniques for creating more complex environments, modeling, lighting, materials, characters, interaction, and behaviors. Two 2-hour lectures per week and assigned work. Typically Offered: Spring.
Prereqs: VTD 1520

VTD 1540 Virtual World Building 4 (2 credits)
Synthesis of processes, principles, tools, and techniques associated with virtual world building. Two 2-hour lectures per week and assigned work. Typically Offered: Spring.
Coreqs: VTD 1530

VTD 2000 (s) Seminar (1-16 credits, max 99)
Credit arranged

VTD 2010 History & Theory of VR (3 credits)
This seminar course is designed to develop the historical and philosophical understanding of virtual reality (VR) technology and its cultural evolution. The course will explore the formal description of VR technology and interpret recent psychological theories of VR knowledge construction. Typically Offered: Spring.
Prereqs: VTD 1540

VTD 2040 (s) Special Topics (1-16 credits, max 99)
Credit arranged

VTD 2450 Advanced Modeling (3 credits)
Exploration of methods used for modeling and sculpting organic surfaces focused on the creation of character and avatar for high and low polygon 3D digital models. Three 1 hour lecture/labs per week and associated work. (Fall only)
Prereqs: VTD 1540

VTD 2460 Advanced Lighting and Materials (3 credits)
Exploration of methods for illuminating and texturing virtual objects and environments. Foreground, middleground and background rendering issues are examined through topics that include radiosity, ray-tracing, procedural materials and render engine options. Three 1-hour lecture/labs per week and associated work. (Fall only)
Prereqs: VTD 1540

VTD 2470 Intro to Scripting and Parametric Design (3 credits)
This is an introductory course to basic scripting and parametric modeling. This course will introduce students to Python, an object-oriented programing language. Students will learn the fundamentals of Python through 2D game development and through creating custom components to integrate with the parametric 3D modeling design process. Typically Offered: Varies.

VTD 2530 Virtual Design I (3 credits)
Investigation of the art and science of virtual design, integrating creative problem solving skills with computer technologies. Sequence of exercises explores the problem domains of virtual objects and environments. Two 3-hour studios per week and assigned work. Typically Offered: Fall.
Prereqs: VTD 1540

VTD 2540 Virtual Design II (3 credits)
Continued development of critical thinking and problem solving skills through a sequence of exercises that emphasize design process, concept and context driven solutions to virtual, tangible, and integrated projects. Two 3-hour studios per week and assigned work. Typically Offered: Spring.
Prereqs: VTD 2530 or Permission

VTD 2710 Cross-Reality Technology I (3 credits)
Introduction to the fundamentals of Cross-Reality (XR) technologies, explore the development and delivery of interactive immersive digital worlds that transform and combine physical reality into virtual experiences. Two 1-1/2-hour lecture-labs per week and associated work. Typically Offered: Fall.
Prereqs: VTD 1540

VTD 2990 (s) Directed Study (1-16 credits, max 99)
Credit arranged

VTD 3010 Theory & Applications of VR (3 credits)
This seminar course is designed to develop the student's understanding of virtual reality (VR) design theory and application. The course will challenge students to develop new concepts for VR that have the potential to significantly impact society and expand on current concepts of the built environment. Typically Offered: Spring.
Prereqs: VTD 2010 or Permission

VTD 3550 Virtual Design III (4 credits)
Introduction to virtual design and relationship to human needs; focus on design process and expansion of vocabulary associated with virtual environments; experimentation & creativity encouraged. Three 3-hour studios per week and assigned work. Typically Offered: Fall.
Prereqs: VTD 2540 or Permission

VTD 3560 Virtual Design IV (4 credits)
Design development of conceptual and technical aspects of virtual environments; exploration of design issues from conception to delivery. Three 3-hour studios per week and assigned work. Typically Offered: Spring.
Prereqs: VTD 3550 or Permission

VTD 3670 Animation and Visual Effects (3 credits)
Exploration of methods used for visual and experiential communication, problem solving, and storytelling through linear and interactive 3D computer generated animation. Three 1-hour lecture/labs per week and associated work. Typically Offered: Spring.
Prereqs: Permission

VTD 3720 Cross-Reality Technology 2 (3 credits)
Building upon the foundational knowledge of Cross-Reality (XR) technologies, exploring how current and emerging versions of XR technologies can enhance XR interactions (object-oriented and event-driven) and user experiences (story telling/presence/social/multiuser) in virtual worlds. Two 1-1/2-hour lecture/labs per week and associated work. (Spring only)
Prereqs: VTD 2710 or Permission

VTD 3800 Advanced Character Design (3 credits)
Exploration of advanced workflows and methods for entertainment focused character design. This course will cover advanced digital painting techniques and basic image compositing in Photoshop while also covering digital sculpting and rendering using Zbrush. One 3-hour lecture/lab per week with associated work.
Prereqs: Instructor Permission

VTD 3980 (s) Internship (1-16 credits, max 99)
Credit arranged

VTD 4000 Seminar (3 credits, max 99)
Credits arranged

VTD 4040 (s) Special Topics (1-16 credits, max 99)
Credit arranged

VTD 4250 Human Technological Systems and Human Machine Interface Seminar (3 credits)
The course is an overview of user interaction design, and evaluation of physical and virtual human-machine systems. Topics include introduction to human factors, human technological systems, usability evaluation, human machine interface (HMI), human computer interaction (HCI) in virtual reality, human error, human performance, mixed-initiative systems (intelligent and autonomous teaming), design and prototyping. This is an online course to introduce Virtual Technology and Design students to human factors, human computer interaction design and evaluation, emphasizing mixed-initiative systems and virtual reality. The first half of the course develops the theory and during the second half, students lead and conduct individual projects related to the course content. Typically Offered: Fall and Spring.

VTD 4570 Capstone Design Studio I (6 credits)
General Education: Capstone Experience
Sequential contract courses built around the collective content of five interdisciplinary clusters; research, design and implementation of comprehensive virtual design project. Three 3-hour studios per week and associated work.
Prereqs: VTD 3560

VTD 4580 Capstone Design Studio II (6 credits)
Sequential contract courses built around the collective content of five interdisciplinary clusters; research, design and implementation of comprehensive virtual design project. Three 3-hour studios per week and associated work.
Prereqs: VTD 4570

VTD 4970 Teaching Assistant, Undergraduate (1-16 credits, max 99)
Credit arranged. Teaching assistant services performed by advanced undergraduate students with faculty supervision.

VTD 4990 (s) Directed Study (1-16 credits, max 99)
Credit arranged