VTD 101 Introduction to Virtual Reality
3 credits
This course explores introductory design methods for virtual reality (VR) design and technical application. Designed to allow students the ability to rapidly develop their programming, and technical design skills required to produce VR experiences. Three 1 hour online lecture/lab a week and associated work.

VTD 151 Virtual World Building 1
2 credits
Introduction to the processes and principles of design associated with virtual world building. Two 2-hr lectures a week and assigned work. Recommended Preparation: ART 110 and 121.

VTD 151L Lab: Virtual World Building 1
1 credit
This course is designed to support and further develop the comprehension of virtual reality design technology within the VTD 151: Virtual World Building 1 course.
Coreq: VTD 151 or Permission.

VTD 152 Virtual World Building 2
2 credits
Applied tools and techniques. Exploration of the processes and principles of design associated with virtual building. Two 2-hr lectures a week and assigned work. Recommended Preparation: ART 110 and ART 121, VTD 151. (Spring only)

VTD 152L Lab: Virtual World Building 2
1 credit
This course is designed to support and further develop the comprehension of virtual reality design technology within the VTD 152: Virtual World Building 2 course.
Coreq: VTD 152 or Permission.

VTD 153 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-hr lectures a week and assigned work. Recommended Preparation: ART 110 and ART 121.

VTD 153L Lab: Virtual World Building 3
1 credit
This course is designed to support and further develop the comprehension of virtual reality design technology within the VTD 153: Virtual World Building 3 course.
Coreq: VTD 153 or Permission.

VTD 154 Virtual World Building 4
2 credits
Synthesis of processes, principles, tools and techniques associated with virtual world building. Two 2-hr lectures a week and assigned work. Recommended Preparation: ART 110 and 121.

VTD 154L Lab: Virtual World Building 4
1 credit
This course is designed to support and further develop the comprehension of virtual reality design technology within the VTD 154: Virtual World Building 4 course.
Coreq: VTD 154 or Permission.

VTD 200 (s) Seminar
Credit arranged.

VTD 201 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.
Prereq: VTD 154.

VTD 204 (s) Special Topics
Credit arranged.

VTD 244 Introduction to 3D Modeling
3 credits
Introduction to 3D digital modeling focused on high and low poly polygon hard surface assets and digital sets (including basic lighting and materials). Two 1-1/2hr lecture/lab a wk and associated work.
Prereq: Major in Virtual Technology and Design; non-majors by permission as space permits.

VTD 245 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 hr lecture/lab a wk and associated work. (Fall only)
Prereq: VTD 244 or Permission.

VTD 246 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 1hr lecture/lab a wk and associated work. (Fall only)
Prereq: VTD 244 or Permission.

VTD 253 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-hr studios a week and assigned work. (Fall only)
Prereq: ART 121 and VTD 152; or Permission.

VTD 254 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-hr studios a week and assigned work. (Spring only)
Prereq: VTD 253 or Permission.
VTD 266 Animation
3 credits
Introduction to 3D computer-generated animation addressing interface, character rigging, and linear animation. Two 1-1/2hr lecture/lab a wk and associated work. (Spring only)
Prereq: VTD 244 or Permission.

VTD 271 Cross-Reality Technology 1
3 credits
Introduction to the fundamentals of Cross-Reality (XR) technologies, explore the development and delivery of interactive immersive digital worlds that transform/combine physical reality into virtual experiences. Two 1-1/2hr lecture/lab a wk and associated work. (Fall only)
Prereq: VTD 154 and VTD 244; or Permission.

VTD 299 (s) Directed Study
Credit arranged.

VTD 301 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.
Prereq: VTD 201 or permission.

VTD 355 Virtual Design III
4 credits
Introduction to virtual design & relationship to human needs; focus on design process & expansion of vocabulary associated with virtual environments; experimentation & creativity encouraged. Three 3-hr Studios a wk and assigned work. (Fall only)
Prereq: VTD 254 or Permission.

VTD 356 Virtual Design IV
4 credits
Design development of conceptual & technical aspects of virtual environments; exploration of design issues from conception to delivery. Three 3-hr studios a wk and assigned work. (Spring only)
Prereq: VTD 355 or Permission.

VTD 367 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/lab a week and associated work. (Spring only)
Prereq: VTD 266 or Permission.

VTD 372 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 1-1/2hr lecture/lab a wk and associated work. (Spring only)
Prereq: VTD 271 or Permission.

VTD 380 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 with associated work.
Prereq: Instructor Permission.

VTD 398 (s) Internship
Credit arranged.

VTD 400 (s) Seminar
3 credits.

VTD 404 (s) Special Topics
Credit arranged.

VTD 444 Other Media
3 credits
Exploration of new or emerging technologies including but not limited to software and various hardware devices. The focus is on the communicative, affective, and interactive possibilities of the technology and their application within research or creative production.
Prereq: Permission.

VTD 457 Capstone Design Studio I
6 credits
Gen Ed: Senior Experience
Sequential contract courses built around the collective content of five interdisciplinary clusters; research, design & implementation of comprehensive virtual design project. Three 3-hr studios a wk and associated work.
Prereq: VTD 356.

VTD 458 Capstone Design Studio II
6 credits
Sequential contract courses built around the collective content of five interdisciplinary clusters; research, design & implementation of comprehensive virtual design project. Three 3-hr studios a wk and associated work.
Prereq: VTD 457.

VTD 497 Teaching Assistant, Undergraduate
Credit arranged
Teaching assistant services performed by advanced undergraduate students with faculty supervision.

VTD 499 (s) Directed Study
Credit arranged.