STRANDS AND STANDARDS
AUGMENTED REALITY AND VIRTUAL REALITY

Course Description

Separating hype from reality is hard, especially in the fast-growing and evolving space of augmented and virtual reality (AR/VR). Recent advances in technology has allowed AR/VR systems to become extremely sophisticated and realistic. This course introduces students to the technologies that underpin AR/VR systems. Then the course walks through 5 applications of AR/VR and how they will change and impact numerous aspects of our lives and the economy. Students will also learn about and discuss the risks and side effects of these systems, including health, privacy, and ethical implications.

Intended Grade Level	9-12
Units of Credit	0.5
Core Code	35.02.00.00.014
Concurrent Enrollment Core Code	35.02.00.13.014
Prerequisite	None
Skill Certification Test Number	000
Test Weight	0.0
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Cybersecurity
Endorsement 2	Information Technology Systems
Endorsement 3	Multimedia
Endorsement 4	Programming & Software Development
Endorsement 5	Web Development

STRAND 1

Introduction to Augmented and Virtual Reality

Standard 1

Students will explore AR, VR, and Mixed Reality. They will learn about the key components that make this technology possible and the people who invented them.

Standard 2

Students will also look at all the cool ways that these mind-bending headsets were developed, including a predecessor technology known as Heads Up Display or HUD.

Standard 3

Students will preview how people and businesses are using them NOW, and how they might be used in the future.

STRAND 2

Exploring Augmented Reality Systems. There are many different technology companies that are designing and producing sophisticated AR glasses and goggles that we may see more and more out on the streets.

Standard 1

Student will define and explore the key components that make up AR systems and compare many of the various projects and headsets that are being developed.

Standard 2

Students will also discover career opportunities in this new and growing field.

STRAND 3

Exploring Virtual Reality Systems. In early 2016, two major virtual reality systems, HTC Vive and Occulus Rift, hit the market, ushering in a new age of virtual reality gaming experiences.

Standard 1

Students will explore these and other VR systems and the technologies and components that make them work. VR systems can be as simple as a smartphone inserted into a specialized cardboard device to a full-size immersive room known as a CAVE.

Standard 2

Students will discuss the potential impact of these systems on society and learn about career tracks available for those interested in VR system development.

STRAND 4

Exploring AR/VR in gaming. The future of gaming is here! Gaming is one of the first ways that many people will experience AR or VR for the first time, whether through a smartphone game app, AR glasses, or a full-blown VR gaming system. A new immersive way of experiencing a video game has been made possible through rapidly improving technologies.

Standard 1

Students will evaluate the variety of gaming applications across both augmented and virtual reality systems.

Standard 2

Students also evaluate the potential impact this new gaming medium will have on both participants and society.

Standard 3

Students will explore career opportunities in this very new field.

STRAND 5

Exploring AR/VR in Education. Take a field trip with your entire class to view the Great Wall of China or Machu Picchu in the mountains of Peru. With AR/VR, it is now possible.

Standard 1

Students will engage in learning about the impact of AR/VR on education with applications such as Astronaut Training, Google Expeditions, and other devices in various professions.

Standard 2

Students will be able to identify the potential drawbacks and distractions that AR/VR can cause in education along with identifying potential career paths and opportunities.

STRAND 6

Exploring AR/VR in Entertainment. Imagine if you could watch your favorite sports team not from your couch or nosebleed seats, but through virtual reality, you could be at center court, on the 50-yard line, or behind home plate. Or if concerts are your thing, virtual reality could transport you to front row seats, with stunning visual and audio to make you feel as if you are right there.

Standard 1

Student will examine the vast entertainment applications of AR and VR, from sports and concerts to cinematic experiences and location-based entertainment.

Standard 2

Students will also discuss the impact of AR and VR systems on social isolation.

STRAND 7

Exploring AR/VR in Healthcare. Virtual reality in healthcare has already provided huge benefits to doctors and patients, yet there is still much to discover in this industry through AR/VR. Imagine being able to see the complete view of a surgeon during an operation and the experience it will provide to future surgeons. It has already taken the teaching and learning experience to a new level.

Standard 1

Students will learn of the impact AR/VR will have on healthcare of the future.

STRAND 8

Exploring AR/VR in Architecture, Engineering and Construction. In Architecture and Engineering, design and development are very critical. But the problem encountered with the design and development is that the plans are 3D dimensions, but typically created on 2D planes. This makes it difficult to capture the full scale of the design. But thanks to AR/VR, engineers and architects are now able to view plans in a way that they never had before.

Standard 1

Students will understand and review the key terms related to architecture and engineering AR/VR.

Standard 2

Students will be able to evaluate various applications for real estate and construction tours.

STRAND 9

Exploring AR/VR in Shopping. Through AR, we now can see how rooms in our home would look before spending all that money, and later find out that it doesn't look right.

Standard 1

Students will explore the various ways in which AR/VR are being used to create shopping experiences.

Standard 2

Students will learn about the trends along with the pros and cons of AR/VR of virtual shopping.

STRAND 10

Exploring Social AR/VR and Telepresence. Holograms have been a staple of science fiction books and movies. Three-dimensional images of a person are projected into space, making it seem as if they are there. Not surprisingly, the technology being augmented reality is bringing this closer to happening. The fields of telepresence and telerobotics could have huge implications for how we work, collaborate, and interact with other people.

Standard 1

Students will explore the applications and potential impact of these exciting and innovative areas.

Skill Certificate Test Points by Strand

Example table below. Refer to instructions for specifics.

Test Name	Test #	Number of Test Points by Standard										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		
AUGMENTED REALITY AND VIRTUAL REALITY	8##	12	7	5	3	10	5	4	3	8	4	79	61
Industry Exam	9##												