

**Arab Academy for Science and Technology and Maritime Transport
Computer Science Curriculum
Course Syllabus**

Course Code: CS453	Course Title: Virtual Environments	Classification: E	Coordinator's Name: Dr. Abeer Bader	Credit Hours: 3
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Pre-requisites: CS352 (Computer Graphics)	Co-requisites: None	Schedule: Lecture: 2 hours Tutorial-Lab: 2 hours		
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Course Description:

Basic concepts. Virtual worlds. Hardware and software support. World modeling. Geometric modeling. Light modeling. Kinematics and dynamic models. Other physical modeling modalities. Multi-sensor data fusion. Anthropomorphic avatars. Animation: modeling languages, scripts, real-time Computer Architectures. VE interfaces.

Textbook:

G. Burdea and Ph. Coiffet, *Virtual Reality Technology*, 3rd Edition with CD-ROM, Wiley, New Jersey.

References:

- G. Burdea and Ph. Coiffet, *Virtual Reality Technology*, 2nd Edition with CD-ROM, Wiley, New Jersey.
- R. Carey and G. Bell, *The Annotated VRML 2.0 Reference Manual*, Addison-Wesley Developers Press.

Course Objective/Course Learning Outcome:	Contribution to Program Student Outcomes:
<p>Know that virtual environments are a fundamental part of the revolution in communications that has taken place over the past decade.</p>	<p>(SO1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.</p>
<p>Understand the science of computer graphics in the context of real-time virtual environments.</p>	<p>(SO2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.</p>
<p>3 Understand the perceptual, dynamic and interaction aspects of virtual environments.</p>	<p>(SO6) Apply computer science theory and software development fundamentals to produce computing-based solutions.</p>
<p>Course Outline:</p> <ol style="list-style-type: none"> 1. Introduction 2. Enabling Technologies of virtual reality 3. Definition and Characteristics of virtual reality 4. Development Tools: Unity 5 5. Applications 6. Human Factors and Human Perception 7. Computer Graphics Principles for virtual reality 	<ol style="list-style-type: none"> 8. Design principles 3; 3D math 9. Geometric Modeling Principles for virtual reality 10. Modeling of Virtual Environments 11. 3D perception, displays, and devices 5; Selection and manipulation 12. Special Topics

Grade Distribution:

7th Week Assessment (30%)

12th Week Assessment (20%)

Year Work (10%)

Final Exam (40%)

Policies:

Attendance:

AASTMT Education and Study Regulations
(available at aast.edu)

Academic Honesty:

AASTMT Education and Study Regulations
(available at aast.edu)

Late Submission:

Late submissions are graded out of 75% (1 week late), 50% (2 weeks late), 25% (3 weeks late), 0% (more than 3 weeks late)
