

The Windows Graphics Course

This 5-day course is intended for software development and validation engineers that want to learn about the graphics and display technologies used in modern Windows operating systems through Windows 8. At course completion, learners should have an understanding of all the components that participate in the display of information on a Windows system.

Course Outline

- 1) Windows Display Technologies
 - a) Windows Display Driver Model
 - b) Kernel mode components
 - c) User mode rendering
 - d) DirectX interface
 - e) OpenGL interface
 - f) Media interface
 - g) Graphics HW
- 2) Graphics Kernel System
 - a) Why a graphics kernel is needed
 - b) Graphics memory management
 - c) Units of Graphic Execution
 - d) Graphics scheduling
 - e) Timeout Detection and Recovery
 - f) Debugging the GKS
- 3) Display Port Driver
 - a) Miniport driver structure
 - b) CreateDevice
 - c) CreateAllocation
 - d) Present/Render
 - e) Submit
 - f) Patch
 - g) Interrupt
 - h) Initialization
- 4) DirectX
 - a) D3D Interface basics
 - b) Quick COM basics
 - c) Initialization & Release
 - d) The Device Object
 - e) Image Surfaces
 - f) Draw Primitives
 - g) Bitmap Images

- h) Present
- 5) OpenGL
 - a) Implementations: HW vs. SW
 - b) API vs. Language
 - c) OpenGL Data Types
 - d) Buffering
 - e) Shapes
 - f) Solid Objects
 - g) Transformations
 - h) Color & Lighting
 - i) Imaging with OpenGL
 - j) Textures
- 6) Media Display
 - a) Windows Media Foundation
 - b) Audio/Video Pipelines
 - c) Media Sources
 - d) Transforms & Decoders
 - e) Sinks
 - f) Frames & Rates
 - g) DirectX Media Objects (DMO's)
 - h) TopoEdit
- 7) User Mode Display Driver
 - a) UM driver structure
 - b) CreateDevice
 - c) CreateResource
 - d) D3D Drawing Primitives
 - e) Present & Flush
 - f) Initialization
- 8) 3D Graphics
 - a) 3D Coordinate system
 - b) View ports
 - c) Transformations
 - d) Coordinate translation
 - e) Rotation
 - f) Perspective
 - g) Wire frame
 - h) Shading
- 9) Graphics Hardware
 - a) Typical HW Implementations
 - b) Pipeline
 - c) Acceleration Opportunities
 - d) Raster Algorithms

- e) Sampling, Aliasing, Filtering
- f) OpenCL
- g) Typical HW Implementation
- 10) Graphics Compilers
 - a) Role of compilers in graphics
 - b) Static vs dynamic compilation
 - c) Rendering compilers
 - d) Shading compilers
 - e) Visual Studio graphics compiler
- 11) 2D Graphics
 - a) Graphics Device Interface
 - b) Pens
 - c) Brushes
 - d) Fonts
- 12) Aero and "Metro"
 - a) Graphics in Windows 8
 - b) XAML
 - c) Metro, XAML, & DirectX
 - d) What happened to Aero?