

CSc-165 Spring 2023 Midterm Study Guide

- game “design” vs “architecture”
- “genres”, “themes”, and “dimensionality”
- the role of a game engine
- core elements of a game engine
- concept of “frame” and “frame rate”
- tightly-coupled game loop
- Input “devices” and “controllers”
- Device abstractions – “button”, “key”, “axis”
- The role of an input manager – providing an input event mechanism, managing input event queues, etc
- Understand how to set up action handling for input events (e.g., in pseudocode)
- Modifier actions
- Homogeneous 3D coordinate for points, vectors, and matrices
- Specifying a camera with position and UVN axes
- Specifying a view frustum
- Basic camera manipulation: move, rotate (pitch, yaw, roll), look-at
- Local vs. Global yaw
- Specifying object vertices and vertex attributes (position, texture coordinates, normal vectors)
- Rasterizing of vertices and their attributes
- How texture images are applied based on texture coordinates
- Specifying indexed vs non-indexed vertices
- The concept of a graphics pipeline, and its relationship to rasterization
- Homogeneous Translate and Scale matrices
- Rotation with Euler angles
- The purpose of a perspective matrix
- Factors used to specify Ambient, Diffuse, and Specular (ADS) components of a lighting model
- Specifying light types: point (positional), spot, and ambient
- Material specification and its role in lighting
- 6DOF vs constrained camera controllers
- Specifying a “mouse-look” controller
- Factors in setting up viewports
- How to compute camera U,V,N to “look at”
- Chase cameras and “spring” system concept

- Orbit Camera controller – what is stored, what controls are available
- What is Full Screen Exclusive Mode (FSEM)
- Concept and uses of a scenegraph
- Scenegraph traversal including maintaining world transforms
- Hierarchical objects and systems, and using the scenegraph to define them
- Node controllers and how they are incorporated into scenegraph traversal
- Uses for scripting in games
- Executing a script, and executing a script that contains a function
- “fat client” vs “thin client” network server organization for games
- The concept of “ghost avatars”
- Simple network protocol for games
- Possible synchronization issues in networked multiplayer games, and possible solutions

What you don't need to know:

- Memorizing lists of tools
- Java or TAGE classes and coding specifics
- OpenGL and shader pipeline stages
- Jinput classes and coding specifics
- Actual rotation and perspective matrices
- Actual lighting formulas
- Spherical coordinate formulas
- Java DisplayMode
- Javascript syntax
- UID and UUID, server discovery, TCP vs UDP, multicast groups

Logistical Details:

- DATE: Wednesday March 15
- MODE: *IN-PERSON*
- LOCATION: RVR-5029
- CLOSED BOOK / CLOSED NOTES
- LENGTH: 50 minutes
- START TIME: at the start of class (Wednesday lecture continues after exam)
- BRING: pencil or pen / eraser