

CSC 133: Object-Oriented Computer Graphics Programming – Spring 2018

TENTATIVE COURSE OUTLINE

Week	Topics	Readings and Assignments
1	Course Introduction and Overview Introduction to Mobile App Development and CN1 OOP Concepts: Abstraction; Encapsulation (Classes & Accessors); UML Class Diagrams, Class Associations (Aggregation and Composition)	CN1: Ch 1 Secs 1.1, 1.5, 1.7 Horstmann: Ch 1 (all); Ch 2 Sec 2.1–2.8; Ch 3 Sec 3.1–3.4; Ch 7 Sec 7.1 – 7.4
2	Inheritance: Inheritance Hierarchies; Overriding and Overloading; Extension vs. Specialization vs. Specification; Abstract Classes and Methods; Single vs Multiple Inheritance	Horstmann: Ch 6 Sec 6.1, 6.3, 6.8, 6.9 A#1: Class Associations
3	Polymorphism: Types of Polymorphism (Static vs Dynamic); Upcasting and Downcasting Interfaces: Interface Hierarchies; Interface Subtypes, Interfaces and Polymorphism; Abstract Classes vs Interfaces; Multiple Inheritance via Interfaces	Horstmann: Ch 3 Sec 3.5; Ch 4 Sec 4.1–4.5
4	Design Patterns: Creational vs. Structural vs. Behavioral; Singleton, Composite, & Iterator Patterns; Observer Pattern; MVC Architecture	Horstmann: Ch 5 Sec 5.1–5.3, 5.5; Ch 10 Sec 10.5
5	GUI Basics: Display Devices & Color; Components in CN1 User Interface (UI) package (Component, Container, Form, Dialog, Label, Button, Checkbox, TextField, SideMenu); Layout Managers and Strategy Pattern	Schaum: Ch 1; Ch 2 Sec 2.1–2.4; CN1: Ch 2 Sec 2.1, 2.3, 2.4; Ch 5 Sec 5.1–5.4, 5.6–5.8, 5.13, 8.13 Horstmann: Ch 5 Sec 5.4.3, 5.7, 5.8 A#2: Design Pats. & GUIs
6	Event-driven Programming: CN1 Action Handling (ActionEvent, ActionListener, Command); CN1 Key Handling; Command, Factory and Proxy Patterns	CN1: Ch 6 Sec 6.19 Horstmann: Ch 5 Sec 5.3 Ch 10 Sec 10.2, 10.3, 10.4
7	Interactive Techniques: CN1 Graphics and Component Repainting, Pointer Handling; Object Selection	CN1: Ch 6 Sec 6.9
8	Introduction to Animation: Frame-based Animation; CN1 UIMTimer, Animation via Image Movement; Collision Handling <u>MIDTERM EXAM</u>	A#3: Interactive Graphics & Animation

9	Introduction to Sound: Sound Files, Sound APIs, CN1 MediaManager and Media Transformations: Vectors and Matrices, Affine Transformations, Matrix Representation, Homogeneous Coordinates, Concatenation of Transforms	Schaum: Appendix 1; Ch 4 Secs 4.1-4.3
10	Applications of Affine Transforms: CN1 Coordinate Systems and Transforms, Local Coordinate Systems, Display-mapping Transforms, Transformable Objects, Composite Transforms, Hierarchical Object Transforms, Dynamic Transforms	CN1: Ch 6 Sec 6.18 Schaum: Ch 4 Sec. 4.4
11	Viewing Transforms: World & Display Coordinate Systems; World-to-Display Mapping, World Window, and the Viewing Transformation (VTM); Zoom and Pan; Display-to-World Mapping; Clipping	Schaum: Ch 5 Sec 5.1–5.3, 5.5 <i>A#4: 2D Transforms</i>
12	Lines and Curves: Rasterization, DDA & Bresenham Algorithms; Parametric Line and Curve Representation; Bezier Curves	Schaum: Ch 3 Sec 3.1, 3.2, 3.8
13	Threads: Java/CN1 Thread and Runnable; Synchronization	Horstmann: Ch 9 (all)
14	Device Installation and Code Signing: Installation of CN1 Apps to Physical Mobile Devices and Code Signing for iOS and Android Devices	CN1: Ch 14 Sec 14.1, 14.2, 14.5, 14.6
15	Additional Topics As Time Permits: Adapter, Decorator, Memento; Review for Final; Introduction to Related CSC Courses	Horstmann: Ch 5 Sec 5.6; Ch 10 Sec 10.1, 10.7
16	Final exam	

Text for the Readings:

- **Horstmann:** Object-Oriented Design & Patterns, 2nd Ed., by Cay Horstmann; Wiley; ISBN 0-471-74487-5
- **Schaum:** Schaum's Outlines Computer Graphics, 2nd Ed., by Xiang & Plastock; McGraw-Hill; ISBN 0-07-135781-5
- **CN1:** Codename One Developer Guide - Revision 3.6 (pdf is available at Canvas)