

CSC 133: Object-Oriented Computer Graphics Programming – Fall 2022

TENTATIVE COURSE OUTLINE

Week	Topics	Readings* and Assignments
1	Course Introduction and Overview Introduction to Mobile App Development and CN1	CN1: Ch 1 Secs 1.1, 1.3, 1.4, 1.5 <i>Assignment #0 is assigned: Introduction to CN1</i>
2	OOP Concepts: Abstraction; Encapsulation (Classes & Accessors); UML Class Diagrams, Class Associations (Aggregation and Composition) Inheritance: Inheritance Hierarchies; Overriding and Overloading; Extension vs. Specialization vs. Specification; Abstract Classes and Methods; Single vs Multiple Inheritance	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 Horstmann: Ch 6 Sec 6.1, 6.3, 6.8, 6.9
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 <i>Assignment #1 is assigned: Class Associations</i>
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, 5.7, 5.8; 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	Schaum: Ch 1; Ch 2 Sec 2.1-2.4; CN1: Ch 2 Sec 2.1, 2.3, 2.4; Ch 5 Sec 5.1-5.3, 5.5-5.8, 5.25
6	Event-driven Programming: CN1 Action Handling (ActionEvent, ActionListener, Command); CN1 Key Handling; Command Pattern	CN1: Ch 10 Sec 10.1 Horstmann: Ch 5 Sec 5.3; Ch 10 Sec 10.2 <i>Assignment #2 is assigned: Design Pats. & GUIs</i>
7	Design Patterns: Strategy, Factory, and Proxy Patterns	Horstmann: Ch 5 Sec 5.4.3, Ch 10 Sec 10.3, 10.4
8	Interactive Techniques: CN1 Graphics and Component Repainting, Pointer Handling; Object Selection MIDTERM EXAM	CN1: Ch 9 Sec 9.1
9	Go Over the Midterm Exam Introduction to Animation: Frame-based Animation; CN1 UTimer, Animation via Image Movement; Collision Handling	

10	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 <i>Assignment #3 is assigned: Interactive Graphics & Animation</i>
11	Applications of Affine Transforms: CN1 Coordinate Systems and Transforms, Local Coordinate Systems, Display-mapping Transforms	CN1: Ch 9 Sec 9.10 Schaum: Ch 4 Sec. 4.4
12	Applications of Affine Transforms: Transformable Objects, Composite Transforms, Hierarchical Object Transforms, Dynamic Transforms Viewing Transforms: World & Display Coordinate Systems; World Window, World-to-Display Mapping, and the Viewing Transformation (VTM)	Schaum: Ch 5 Sec 5.1, 5.5
13	Viewing Transforms: Zoom and Pan; Display-to-World Mapping; Clipping Lines and Curves: Rasterization, DDA & Bresenham Algorithms	Schaum: Ch 5 Sec 5.2, 5.3; Ch 3 Sec 3.1, 3.2 <i>Assignment #4 is assigned: 2D Transforms</i>
14	Lines and Curves: Parametric Line and Curve Representation; Bezier Curves Threads: Java/CN1 Thread and Runnable; Synchronization	Horstmann: Ch 9 (all)
15	Code Signing and Distribution: Code Signing and Distribution for iOS and Android and Installation of CN1 Apps to Physical Mobile Devices Review for the Final Exam Additional Topics As Time Permits: Adapter, Decorator, Memento; Introduction to Related CSC Courses	CN1: Ch 15 Sec 15.1–15.5 Horstmann: Ch 5 Sec 5.6; Ch 10 Sec 10.1, 10.7

FINAL EXAM SCHEDULE:

Section	Date	Time
Section-1 (TR 10:30AM-11:45AM)	Dec 15 (Thursday)	<u>starts at 10:15 am</u>
Section-2 (TR 12:00PM-1:15PM)	Dec 13 (Tuesday)	<u>starts at 12:45 pm</u>

*** 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)