

# CISC 3120 Final Exam topics

This guide intends to give a brief overview of some of the topics we covered in class. It can be used as a check list, however **you should know everything that we have covered in class even if it is not mentioned here.**

## Topics

### Unit II: Java GUI and Graphics

Resources: Textbook covers Swing GUI programming in chapters 7, 8 and 9. Applets are discussed in chapter 10. Also Oracle's Java website along with numerous other websites cover these topics. Topics/questions:

- Differences between Swing and AWT. How would a pure AWT GUI application's look and feel would differ from a similar Swing application?
- AWT and Swing Containers and top-level windows.
- Swing Root Pane Container model.
- Difference between applets and applications. How to run an applet.
- `java.awt.Component` class basics. Why is it important? What are some of its methods?
- Be familiar with common AWT and Swing component classes and how to use them (e.g. buttons, textfields, textareas, labels, radio buttons etc.)
- Differences between LayoutManagers. Know how each layout manager organize components and how to set the layout manager of a frame/panel. Be ready to write a short code snippet to display several components according to specific instructions (simpler version of lab 5 part 4).
- Describe the Java event handling model. What are events and event listeners? Be familiar with the listeners that we used in the labs and ways to implement them.
- Difference between Event listeners and Event adapters.
- What are anonymous inner classes? How are they used in GUI programming.
- Be familiar with the common usage of Graphics and Graphics2D packages. Overriding `paint` and `paintComponent` functions.
- Graphics primitives; how to draw them, change color etc. Differences between methods to render primitives in Graphics and Graphics2D packages.
- Describe threading and concurrency.
- Basic steps for creating and running a separate thread in Java.
- What is Runnable interface used for? How is it implemented? Be ready to write short multithreaded programs.
- Describe the way geometric transformations are represented in Java. Be able to do matrix multiplications. Know how translation, rotation and scaling operations are represented in matrix form. Know why the order of operations matter.
- How are Graphics2D functions `translate`, `scale` and `rotate` are used? What does the `transform` member in Graphics represent?