

1. Fundamentals of digital images

- Be able to use different coordinate systems (origin location, axis orientation, etc)
- Pixel coloring (RGB) within a coordinate system
- High-level difference between raster graphics and vector graphics (+ pros and cons of each)
- Review: Classes 1, Lab 1

2. Lines

- Line equations (both explicit and parametric)
- Slopes, line intersections, line segments, etc
- Line drawing algorithm between two points
- Line clipping algorithm
- Review: Classes 2 and 9-10, Handout 1, Lab 5, HWs 1 and 5

3. Polygons

- Regular polygons and basic trig, convex vs. concave polygons
- Review: Class 3, Lab 2

4. Fill

- Flood fill algorithm, recursion and recursive functions
- Sweep fill algorithm (main idea but not implementation details)
- Review: Classes 4-5, Handout 2, HW 2

5. Transformations

- Rotate, translate, scale, shear, and reflect
- Be able to draw out what a given transformation does
- Matrix form for all transformations above
- Why do we need 3x3 matrices for 2D transformations?
- Matrix multiplication for transformations and their compositions
- Commuting properties for different combinations of transformations
- Review: Classes 5-7, Handout 3, HWs 3-4, Transformation notes

6. JavaScript and HTML Canvas

- Basics of JavaScript (functions, variables, loops, conditionals, etc)
- 2D points, lines, shapes, and coloring them
- Transformations and animations
- Review: Class 2, Lab 3, HWs 1-2 and 4-5

7. Curves

- Concepts and mathematics of Bézier curves
- Be able to draw out what curves would look like from control points
- Recursive-style definition of Bézier curves
- Review: Classes 8-9, Lab 4, HW 5

## CSC 240: Computer Graphics

Midterm: Fall 2016

Completed by:

- This exam is to be taken in the Young Science Library during any of their open hours.
- The time limit is **2 hours** unless you received an email saying otherwise. I will be checking all in/out time stamps.
- No communication about the exam with anyone in the class (or outside the class).
- No electronic devices are to be used during the exam, but you may use a 2-sided cheat sheet. Your cheat sheet should be handwritten and created by you.
- Discussing the exam, going over the time limit, and using electronic devices are all honor code violations.
- The coding question is **not** to be done during these 2 hours. You have unlimited time (until the deadline) outside of the exam for that part (turn in on Moodle).
- Make sure all your work is contained on these pages (writing on the backs is okay).
- If you are unable to make progress on any part of the exam, tell me what you tried; describe your thought process.

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Part 1	/20
Part 2	/20
Part 3	/20
Part 4	/20
Part 5	/20
Total	/100