## CS 2810: Computer Organization and Architecture

<table>
<thead>
<tr>
<th>Fall 2016</th>
<th>Topics</th>
<th>Project (due Wednesday)</th>
<th>Reading (due Monday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 22–26</td>
<td>binary numbers</td>
<td></td>
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<tr>
<td>Aug 29–Sep 2</td>
<td>registers, ARM assembly</td>
<td>1: Maze directions</td>
<td>1: Basic Computing Concepts</td>
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<tr>
<td>Sep 6–9 (Labor Day)</td>
<td>2's complement, masks</td>
<td>2: Write header and RGB</td>
<td>2: The Mechanics of Program Execution (due Wednesday)</td>
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<td>Sep 12–16</td>
<td></td>
<td>3: Gradient image</td>
<td>3: Pipelined Execution</td>
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<td>Sep 19–23</td>
<td></td>
<td>4: Mandelbrot formula</td>
<td>4: Superscalar Execution</td>
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<td>Sep 26–30</td>
<td></td>
<td>5: Fixed Mandelbrot fractal</td>
<td>5: The Intel Pentium and Pentium Pro</td>
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<td>Oct 10–12 (Fall Break)</td>
<td></td>
<td>Midterm exam</td>
<td>7: Antialiased fractal (no reading)</td>
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<td>Oct 17–21</td>
<td></td>
<td>7: Pentium 4 vs G4e: Approaches and Design Philosophy</td>
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<td>Oct 24–28</td>
<td>virtual memory</td>
<td>8: Pentium 4 vs G4e: The Back End</td>
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<td>Oct 31–Nov 4</td>
<td>process, job control</td>
<td>9: 64-Bit Computing and x86-64</td>
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<td>Nov 7–11</td>
<td>caching</td>
<td>10: The G5: IBM's PowerPC 970</td>
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<tr>
<td>Nov 14–18</td>
<td>caching</td>
<td>11: Understanding Caching and Performance</td>
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<tr>
<td>Nov 21–22 (Thanksgiving)</td>
<td>Atari 2600</td>
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<td>Nov 28–Dec 2</td>
<td>malloc, free, gc</td>
<td>12: Intel's Pentium M, Core Duo, and Core 2 Duo</td>
<td>Modern Microprocessors (due Tuesday)</td>
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</tbody>
</table>

Note: the schedule is changing in fall 2016; you should expect significant deviations from the topic and project schedule.

Projects are due by the end of the day on Wednesday of the week listed. Reading assignments are due on Monday of the week listed before class begins. No late work is accepted for reading outlines.

Changes to the schedule will be announced in class.

### Resources

- [Syllabus](#)
- [Examples from class](#)
- [Mandelbrot gallery](#)
- [Mandelbrot explore tool](#)
- [Deep Mandelbrot zoom video](#)

### tools

- [How to set up ssh (public key, firewall)](#)
- [git book](#)
- [git cheat sheet](#)
- [git for computer scientists](#)
- [longer cheat sheet](#)
- [How to set up git for a centralized repository](#)
- [25 tips for intermediate git users](#)
Raspberry Pi

- Recommended kit with black case
- Recommended kit with white case
- MicroSD card benchmarks (use this to help pick a fast 32GB card)

Assembly language resources

- Makefile
- Assembler directives cheat sheet
- Instruction set quick reference

Screencasts

These screencasts are to help you review floats:

- Float review (13:47)
- Converting numbers to floats (10:23)

Reading

Architecture readings and summaries

The assigned reading are crucial to success in this course. The numbered readings refer to chapters in the book Inside the Machine by Jon Stokes (available as an ebook). The final reading is available here:

- Modern Microprocessors: A 90 Minute Guide

For each reading, you must write a brief outline summary and submit it using Canvas. For the chapters from Inside the Machine, you should write about a paragraph for each section heading or diagram, and you should structure it as an outline that follows the chapter structure.

- Be terse and concise. Avoid adjectives and other flowery language. You have very little space to summarize a lot of information.
- Summarize the technical content of the reading. Give equal weight to each section of what you read.
- If you do not understand something, try searching for additional information on Wikipedia or other sources on the web (there is a useful tool called Google…) or come to my office hours. Note that this works best if you do the reading early.

Things to avoid:

- Do not write about your reaction to the reading. Do not waste space telling if you liked it or did not like it or if you found it confusing or you were surprised by it.
- Do not write much about the background material and context. Focus on the technical heart of each reading.
- Do not ask questions in your summary. The time for questions is before you write it.
- Do not use the first person. You are writing about the technical content of the reading assignment, not about yourself.
- Avoid the passive voice.

If you are unsure about any of these guidelines, talk to me, or take your summary to the writing center to get help from a writing tutor.