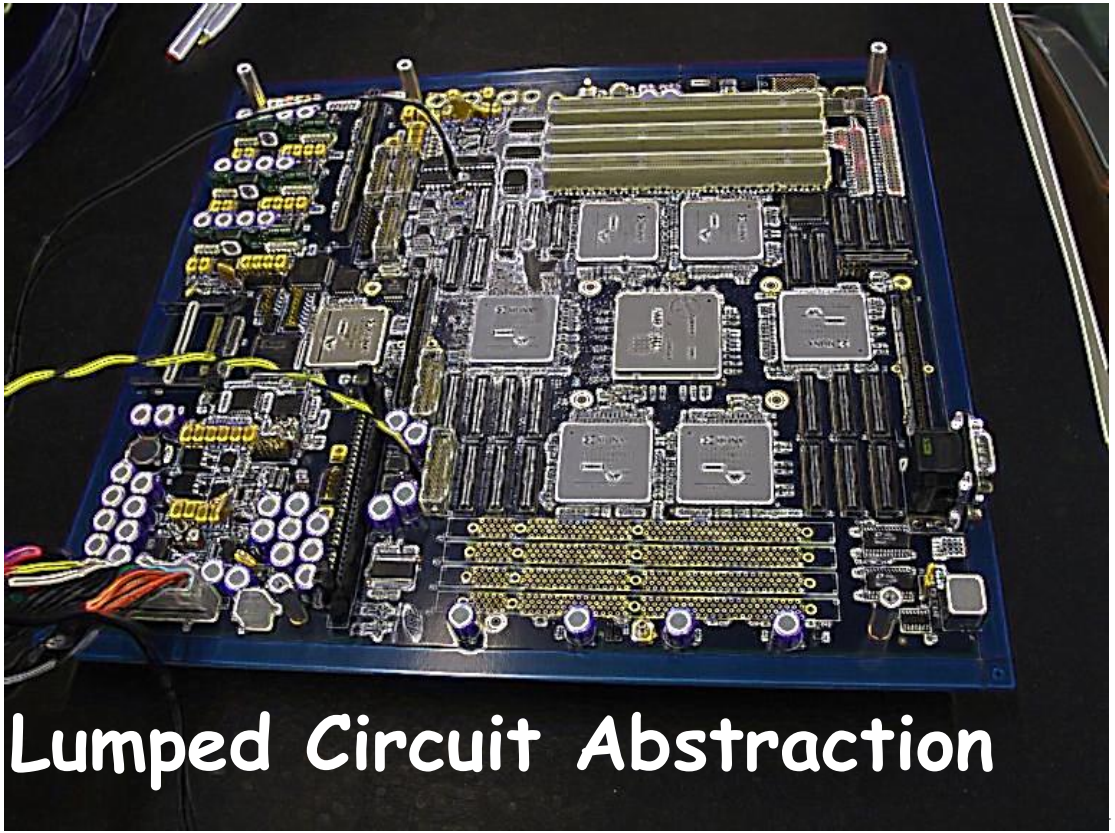
6.002x CIRCUITS AND ELECTRONICS

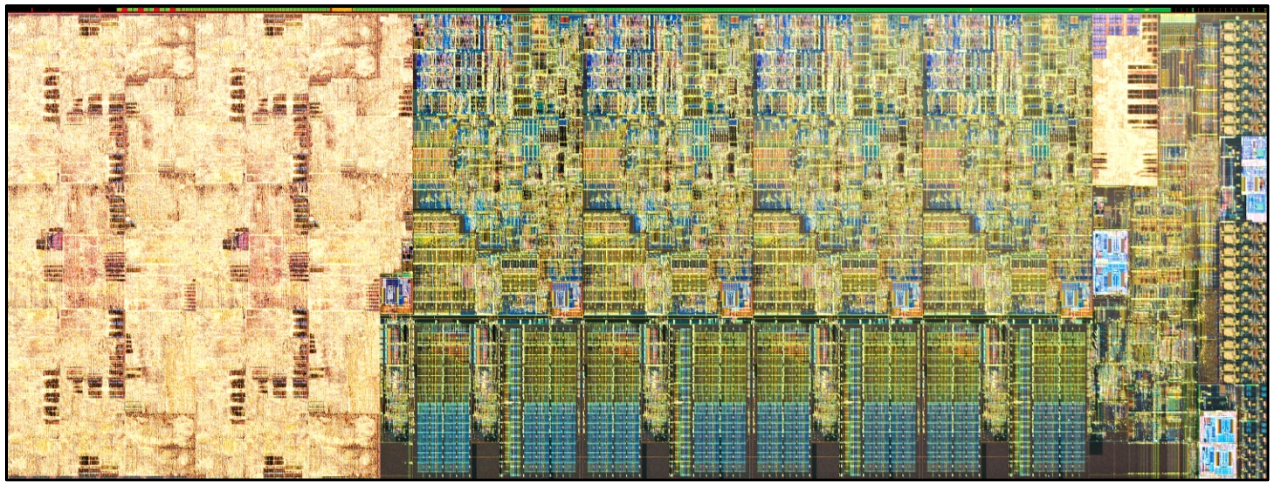


Introduction and Lumped Circuit Abstraction

6.002x is Exciting!

What's behind this?

…and this



Chip photo of Intel's 22nm multicore processor codenamed Ivy Bridge

Photograph courtesy of Intel Corp.

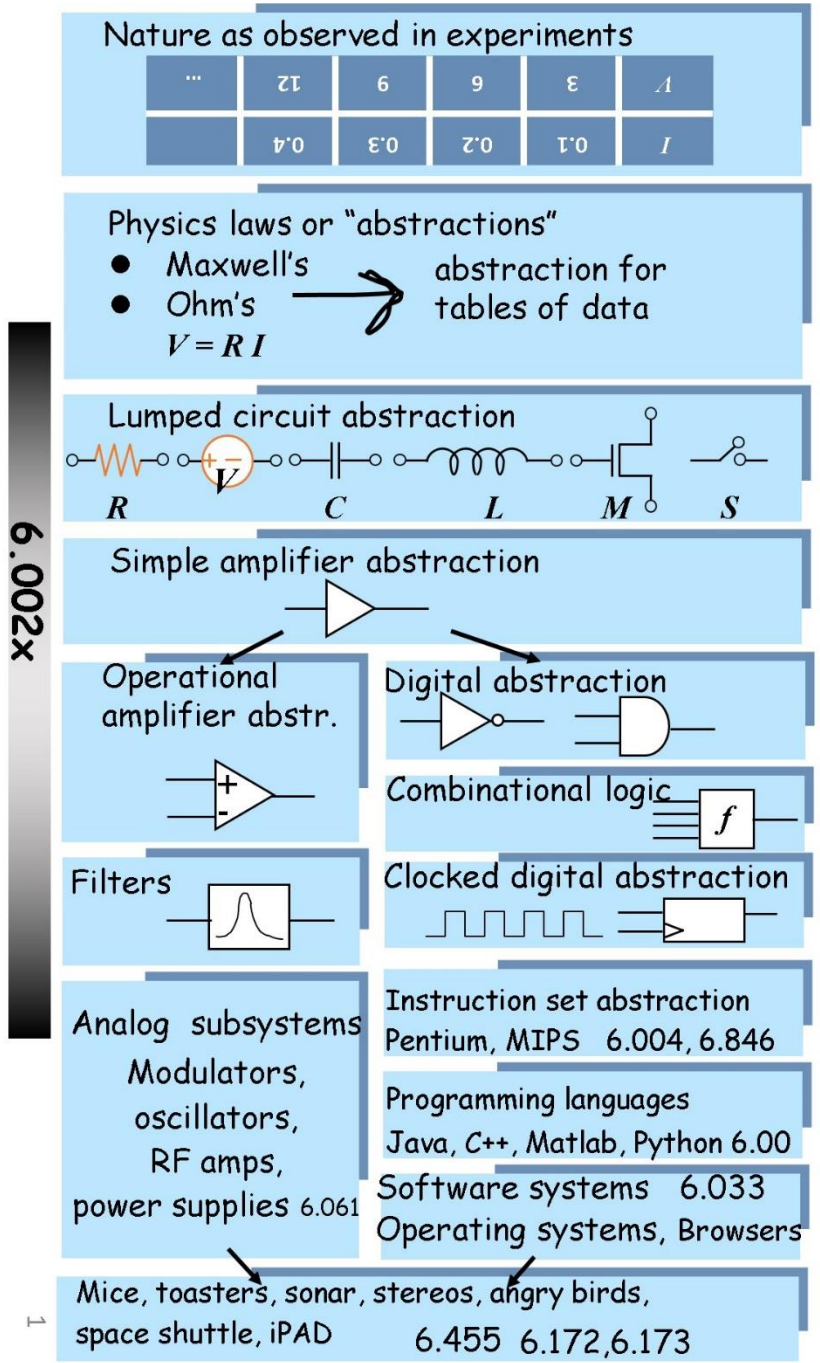
What is engineering?

Purposeful use of science

What is 6.002x about?

Gainful employment of Maxwell's equations

From electrons to digital gates and op-amps


Nature as observed in experiments
V 3 6 9 12 ...
I 0.1 0.2 0.3 0.4
Physics laws or "abstractions"
Maxwell's
Ohm's
V = R I
abstraction for tables of data
Lumped circuit abstraction
R C L M S
Simple amplifier abstraction
Operational amplifier abstr.
Digital abstraction
Combinational logic
f
Filters
Clocked digital abstraction
Analog subsystems
Modulators, oscillators, RF amps, power supplies 6.061
Instruction set abstraction
Pentium, MIPS 6.004, 6.846
Programming languages
Java, C++, Matlab, Python 6.00
Software systems 6.033
Operating systems, Browsers
Mice, toasters, sonar, stereos, angry birds, space shuttle, iPAD
6.455 6.172,6.173
6.002x