

COMPUTER SCIENCE E-1

Understanding Computers & the Internet

EXAM I BRIEFING

Our first exam will take place on Monday, March 11 from 5:30pm–7:30pm EST. You will have two hours to complete the exam. This exam is closed-book, so no notes, calculators, phone-a-friend lifelines, or additional aids will be allowed. Distance students should arrange for a proctor per the policies outlined at <http://cse1.net/proctors>.

The exam will cover the material presented in Lectures 1–4 equally. While no question will draw exclusively from material covered in section, we strongly encourage you to review the section videos as well, as they help cement topics covered in lecture. We also encourage you to review the recaps, which summarize the topics we covered in lecture. Questions on the exam will be similar in spirit to those on the problem sets, and questions will ask you to explain material conceptually as well as apply what you’ve learned to practical situations. Question formats will include multiple-choice, fill-in-the-blank, and short answer.

We’ve seen a lot of different acronyms throughout the first half of the course, but rest assured you will **not** be asked what the “H” in DHCP stands for. Similarly, you will **not** be asked if “MAIL FROM” is an SMTP command or IMAP command. Instead, we’re more interested in your understanding of, for example, what DHCP is and how it relates to your ability to connect to the Internet. In the same vein, we’re more interested in what SMTP and IMAP are actually used for, as well as why you need to know the difference in order to set up an email client on your iPhone. So, while remembering that the “H” in DHCP stands for “host” may help you remember what DHCP *is*, you will not be asked for that level of detail on the exam. After all, that’s not a particularly useful fun fact to have in your back pocket.

Do note, though, that the recaps do cover some material that we didn’t get a chance to talk about in class. Below is a list of the topics that are discussed in recaps that you do **not** need to know for the exam. If in doubt about some topic, don’t hesitate to ask!

- Negative binary numbers (sign-and-magnitude, two’s complement)

- JSON
- Subnetting, Network masks

Here is a list of topics from the first half of the course, broken down by week. This is by no means a comprehensive list of everything we could ever possibly ask you on the exam, but these are the major ideas and concepts we've covered so far. When studying, think not only about what each of these ideas is, but also why each matters in terms of making your computer (and the ones powering that Internet thing) tick.

Week 1

- ASCII
- BIOS
- Binary (converting, addition)
- Bits
- CMOS
- Ethernet
- Gigabyte
- HDMI
- Kernel
- Keyboard
- Kilobyte
- Megabyte
- Motherboard
- Mouse
- Northbridge / Southbridge
- Operating System
- Peripherals
- PCI
- POST

- USB
- UTF-8
- VGA

Week 2

- Caching
- Clock Speed
- CPU
- Cycle
- Endian-ness (big-endian, little-endian)
- HDD
- Filesystem
- Instruction Set (data, arithmetic, control flow)
- Megahertz Myth
- Moore's Law
- Multi-core
- Opcode
- Parallelism
- Pipeline (fetch, decode, execute, store)
- Processes
- Read-Write Head
- RAM
- Registers
- SATA, PATA
- SSD
- Superscalar
- Virtual Memory

Week 3

- 802.11g, 802.11n
- API
- Authoritative Name Server
- Client
- DHCP
- DNS, Records (A, AAAA, CNAME, MX)
- Firewall
- IP Address
- ISP
- IPv4, IPv6
- LAN, WAN
- NAT
- Net Neutrality
- Network
- Phishing
- Private IP Address
- Root DNS Server, TLD DNS Server
- Router
- Routing Table
- Server
- TLD, ccTLD
- URI
- URL

Week 4

- ACK
- Email
- Email Headers, Email Body
- HTTP
- HTTP Headers, HTTP Body
- HTTP Method
- HTTP Status Codes
- IMAP
- POP3
- Protocol
- Queue
- Reliable Data Transfer
- SMTP
- Stack
- TCP
- TCP Handshake
- TCP Segments
- TCP Sequence Numbers
- URL Encoding
- Web Browser