MODULE 15

Lecture 15
Course Summary

Prepared By:
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Electrical and Computer Engineering
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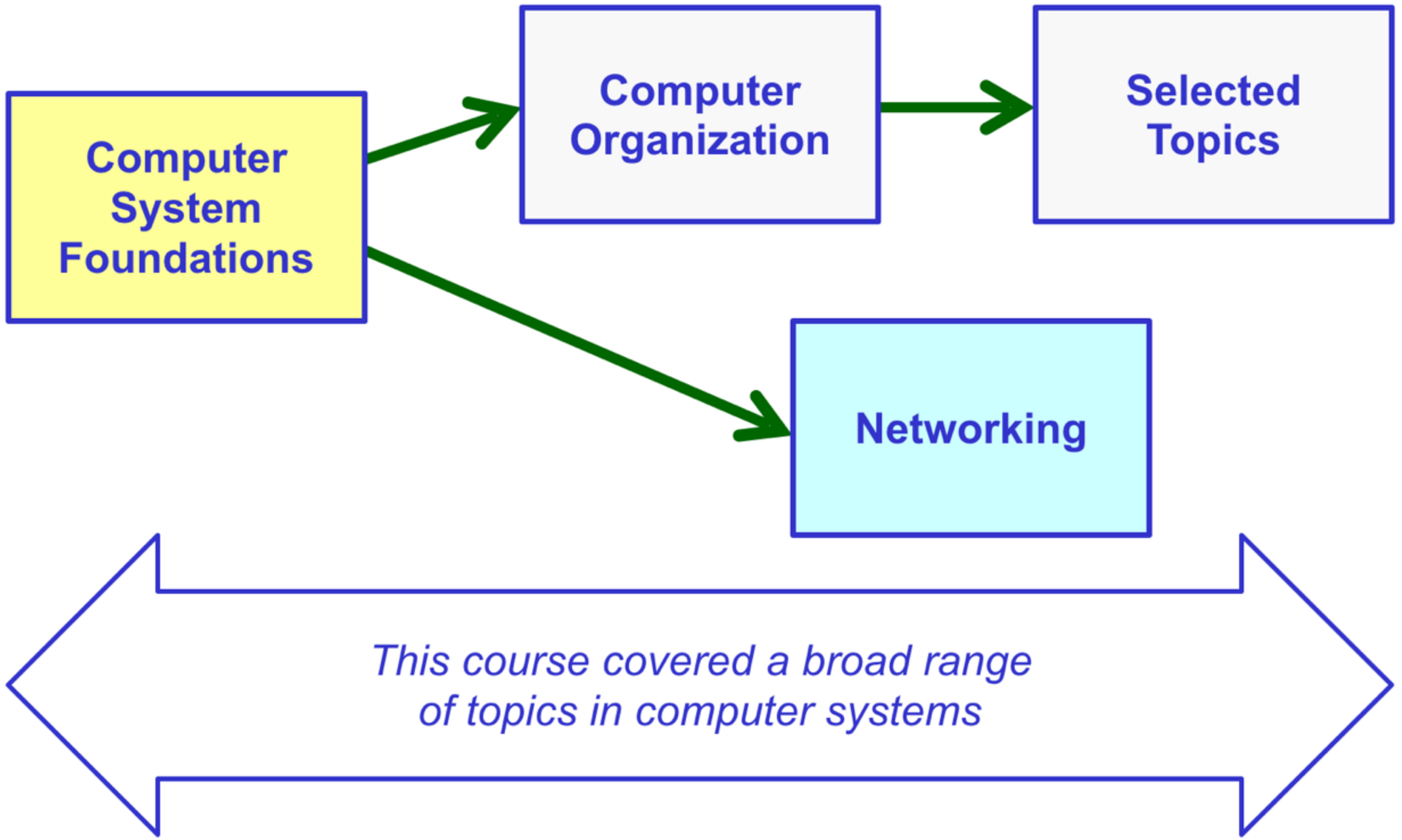
Course Topics



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Course Topics (cont)

- Computer system foundations
  - Representation of information
  - Boolean logic
  - Design and operation of digital logic

- Computer organization
  - Instruction set architectures
  - Memory and input/output systems
  - System software

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Course Topics (cont 2)

- Networking
  - Layered models of protocols
  - The Internet protocol suite
  - Networking technologies

- Selected topics
  - RISC processors
  - Parallel and multiprocessor architectures
  - Performance evaluation

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And Now You Should Be Able To:

- Represent numerical and non-numerical data using standard encoding methods
- Perform arithmetic operations in binary
- Derive logical operations using Boolean operators
- Analyze the operation of simple combinational and synchronous sequential logic circuits
- Analyze sequential behavior using timing diagrams and state diagrams

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And Now You Should Be Able To: (cont)

- Explain the basic organization of a computer, including the instruction set architecture, functions of the central processing unit, cache memory, main memory, mass storage, and other input/output devices
- Explain the principles of operation of von Neumann architectures
- Analyze instruction formats and explain the fetch, decode, and execute cycles of standard instructions

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And Now You Should Be Able To: (cont 2)

- Explain the role of different components of a memory hierarchy including cache and virtual memory
- Explain the role of a compiler and assembler in computer systems
- Explain the relationship between system hardware, operating system software, and software applications

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And Now You Should Be Able To: (cont 3)

- Explain the rationale for a layered model for network protocols
- Explain the basic functions of key protocols in the TCP/IP protocol suite including TCP, UDP, and IP
- Explain the role of the network layer and the operation of typical routing schemes
- Explain the role of medium access control (MAC) and the operation of typical medium access schemes

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And Now You Should Be Able To: (cont 4)

- Compare the functions of typical network components including routers, switches, hubs, and network interface cards
- Determine the content of data packets given packet formats

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And Now You Should Be Able To: (cont 5)

- Describe current technologies for high-performance and embedded computing
- Describe common approaches to computer system performance evaluation

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This Course Should Help You:

- Design software and information systems that must operate efficiently, considering the underlying hardware and networks
- Evaluate planned or deployed computer systems and network systems
- Team with computer system and network designers and engineers
- Undertake more advanced course work in digital systems, computer organization, computer systems, and networking

This is a dynamic field and there will always be new things to learn!

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