

Infolink University College – Hawassa Campus
Department of Computer Science
Program: Regular, Academic Year: 2014 EC

Department: Computer Science

Course Title: Introduction to Computer Science

Course Code: CoSc 101, **Cr. Hrs:** 3

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Course Description:

An overview of Computer Science; historical development of computers; logical organization of a computer system; software, data representation inside computers; computer arithmetic; computer system architecture; overview of computer networks & Computer security. Lab: Introducing the use of PC in an MS DOS, MS Windows environment; Introduction to main MS application packages in that context – MS Excel, MS Word, MS access, MS power point, Introduction to using Internet.

Objectives of the Course:

By the end of this course, students will be able to:

- Find out what computer science is about and explore its applications and impact in other disciplines
- Explain how the computer understands words, numbers, and how data and instructions are stored, retrieved and processed
- Describe basic characteristics of components of a computer system, Illustrate and analyze basics of Computer architecture
- Demonstrate basics of networking. Explain what the Internet is, browse and use the Internet for information and communication purpose,
- Discuss and explain importance of securing computer-based resources (including hardware, software, and information)

Schedule	Chapters and Topics
Week 1	Chapter 1 - Overview of Computer Science 1.1 Introduction to Information and Communication Technology 1.2 Definition of Computer and Computer Science 1.3 Characteristics of computers - Speed, accuracy, capacity, versatility, durability and reliability 1.4 Types of computers - Analog, digital, special purpose, general purpose - Super computers, mainframe computers, minicomputers, microcomputers (desktop, laptop or notebook, PDA or palmtop, handheld) 1.5 Applications of computers - Learning aid, Entertainment, Commercial and business applications, Information utility, Engineering and research applications, Public service
Week 2-3	Chapter 2 - Development of computers 2.1. History of computing - Abacus - Pascal's Calculator - The difference engine and the analytical engine - Herman Hollerith's tabulating machine - Mark I - ENIAC - Electronic Numerical Integrator and Computer - The Von Neumann Machine - Commercial computers 2.2. Generations of computers - First, second, third, and fourth generations - Current Trends

Week 4-5	Chapter 3 - Organization of a computer system 3.1. Introduction to Computer Systems 3.2. Computer hardware - The Central Processing Unit (CPU) - Control Unit - Arithmetic and Logic Unit (ALU) - RAM and ROM - Input/output units - Storage units - Sequential access media (tape) - Random access media (magnetic disk, optical storage, flash memory cards) 3.3. Computer software - System software - Operating systems (OS) - Functions of OS (controlling operations, I/O management, command processing) - Types of OS (single/multi-tasking, single/multi user, real-time, command driven vs. GUI-based) - Example OS (Windows, UNIX, Solaris, MacOS) - Translators (assemblers, compilers, interpreters), and editors - Applications software
Week 6-7	Chapter 4 - Data representation in computers 4.1. Units of data representation - Bit, Byte, Word 4.2. Concept of number systems and binary arithmetic - Binary, Octal, and Hexadecimal number systems - Conversion from one number system to another - Binary arithmetic 4.3 Coding method - EBCDIC (Extended Binary Coded Decimal Interchange Code) - BCD 4 and 6 (Binary Coded Decimal) - ASCII 7 and 8 (American Standard Code for Information Interchange) - UNICODE 4.4 Representation of negative numbers and arithmetic - Signed magnitude, One's complement, Two's complement 4.5 Floating-point representation
Week 8-9	Chapter 5 - Computer System architecture 5.1 Hierarchical structure of computer system architecture 5.2 Logic elements and Boolean algebra - Logic gates and Boolean algebra 5.3 Implementation of Boolean algebra - Boolean functions and truth tables - Construction of logic circuits 5.4 Types of circuits - Combinational and sequential circuits
Week 10-11	Chapter 6 - Computer networks and communications 6.1 Introduction to computer networking and its applications 6.2 Types of networks - LANs (Local Area Networks) and WANs (Wide Area Networks) 6.3 Introduction to the Internet - Services of the Internet (e-mail, World Wide Web, file transfer/access, remote login/ execution, video conferencing)

Week 12	Chapter 7 - Computer security - Introduction to computer security - Encryption - Backup - Viruses and worms
Reference books: • Fikire Sitota and Belay Tedla: fundamentals of information technology; AA, mega publishing enterprise, 2002 • ITL ESL, Introduction to computer science, Pearson edition, 2004 • Kenneth C Laudon, Carol Guercio Traver, Jane Price laudon : information technology and society, second edition, 1996 • Dida Midekso, information technology: Addis Ababa University Printing Press, revised press, 2006. • William Stallings: Computer Organization and Architecture, 5/E, 6/E, Prentice Hall, 2003 • Donald H. Sandar computer concepts and applications; USA; Von Hoffman press, 1987	
Assesment:	<u>Mark</u>
Quiz	15%
Assignment	15 %
Lab Exam	20 %
Final Exam	40 %
Attendance	10%
Total	100 %