# 17CS1101 - BASIC COMPUTER ENGINEERING

(Common to CSE, IT, ECE and EEE)

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| **Course Category:** | Program Core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3-0-0 |
| **Prerequisite:** | Basic usage of computer may be required and a few terms must be known in advance. | **Sessional Evaluation:**  **Univ. Exam Evaluation:**  **Total Marks:** | 40  60  100 |
| **Objectives** | * Understanding the basics of computer fundamentals, identification of various components of computers and their need. * Creating awareness regarding various I/O devices. * Gaining knowledge about the working principle of CPU and its advancements. * Study of different storage media and operating system basics. * Getting fundamental ideas about core concepts of computer domains. | | |

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| **Course Outcomes** | Upon successful completion of the course, the students will be able to: | |
| CO1 | Identify Physical components of a computer and their functionalities and to learn various interactive mechanisms through different devices. |
| CO2 | Understand storage media and strengthen the data processing concepts |
| CO3 | Explore the basic software programming and development concepts. |
| CO4 | Acquire the knowledge on operating system basics. |
| CO5 | Understand the essential networking concepts. |
| CO6 | Gain the basic knowledge in core concepts of computers such as Databases and Security issues. |
| **Course Content** | PREREQUISITE:  Computers for individual users – Desktop, Workstations, Notebook computers, Tablet and Handheld computers, Smart phones, Computers for organizations – Network servers, mainframes, mini and super computers, Computers in society – why are so important, home, Education, Small Business, Industry, Government, Healthcare, Banking and Communication.  UNIT-I  **Inside the Computer:** Various parts of a Computer System - Software, Hardware, Data and Users, Information processing cycle, Essential Computer hardware - processor, Memory, I/O and Storage, Software and major categories- system software and application software.  **I/O Devices:** The Keyboard – Layout, types of keys, input from keyboard, The Mouse –Usage, Variants of mouse, Devices for Hand – Pens, Touch Screens, Game controllers, Optical devices – Bar Code readers, Image scanners and OCR, Monitors – Types, CRT monitors, Flat panel Monitors.  UNIT-II  **Data Storage:** Categories of storage devices, Magnetic – How data is stored and organized on disk, How OS access the data, Diskettes, Hard disks, Removable High-Capacity Magnetic disks, Tape Drives, Optical Storage devices – CD-ROM, DVD-ROM, Recordable Optical Technologies, Solid-state storage devices – Flash Memory, Smart Cards, Solid State Disks.  **Data Processing:** How Computers represent data – Number systems, Bits and Bytes, Text Codes, How Computers process data – the CPU, Machine cycles, Memory, Factors affecting processing speed – Registers, Memory and Computing power, The Computer’s Internal Clock, The Bus, Cache Memory.  UNIT-III  **Software Programming and Development:** Definition of a computer program, Hardware/Software Interaction, Planning a computer program, How programs solve problems-Program control flow, Algorithms, Structured and object oriented programming.  **Programming Languages and the Programming Process:** The evolution of programming languages, Categories- Machine, Assembly and Higher level languages, Systems development life cycle for programming.  UNIT-IV  **OS Basics:** types of Operating Systems – Real Time Operating Systems, Single-user/Single-Tasking OS, Single user/Multitasking OS, Multi-user/Multitasking OS, User interfaces – Graphical User Interfaces, Command-Line Interfaces, Running Programs – Sharing information.  UNIT-V  **Networking Basics:** The usage of Network – Simultaneous access, Shared peripheral devices, Personal Communications and Easier data backup, Common types of networks – LANs, WANs, Hybrid Networks – CANs, MANs, HANs, Intranets and Extranets, Network topologies – Bus, Ring, Star, Mesh, Tree and Hybrid Topologies.  UNIT-VI  **Database Management Systems:** Databases and Database management systems, The database, The DBMS, Working with database, Creating database tables.  **Computer Security:** Basic Security Concepts – Threats, Degrees of Harm, Countermeasures, and Threats to Users – Identify theft, Loss of Privacy, Online Spying tools, Spam, Computer related injuries, Hardware threats – Power related threats, Theft and Vandalism, Natural Disasters. | |
| **Text Books and References** | Text Books:   1. Peter Norton “Introduction to Computers”, McGraw Hill Publishers, 7/e 2011. | |
| Reference Books:   1. Alex Leon and Mathews Leon “Fundamentals of Information Technology”, Vikas Publishers, 2nd Edition 1999. 2. David Cyganski & John A. Orr “Information Technology-Inside and Outside”, Pearson Education, 2002. 3. Marilyn Wolf “Computers as Components”, MK publications, 3rd Edition, 2014. | |
| **E-Resources** | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> | |