Teacher’s Name :- School :-

Year :- 2023 Subject :- Information & Communication Technology

Grade :- 12

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| Competency | Competency Level | Content | Learning Outcomes | No. of Periods | Quality Inputs | Expected Date | Taught Date | Others |
| Competency 1:  Explores the basic concepts of ICT together with its role and applicability in today’s knowledge based society | 1.1  Investigates the  basic building  blocks of  information and  their  characteristics | * Life cycle of data   o Data creation  o Management  o Removal of obsolete data   * Data vs. Information * Definition of information * Characteristics of valuable information: timeliness, accuracy, presented within the context, enhanced understandability and less uncertainty * The need to handle large volumes and other complexities of data   - Introduction | * Defines data and outlines its life cycle * Recognizes the need of a process to define data and information * Recognizes the strong inter relationship between data, process and information * Describes data, process and information * Lists various forms of data and their characteristics * Describes the characteristics of quality data * Distinguishes data from information * Illustrates the value of information * Describes the characteristics of valuable information * Recognizes big data, their needs and analysis | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 1.2  Investigates the  need of technology  to create, disseminate and  manage data and  information | * Applicability of information in day to day life   o Decision making  o Policy making  o Predictions  o Planning, scheduling and monitoring   * Drawbacks of manual methods in manipulating data and information   o Inconsistency and duplication in data, room for errors, human errors and delay in processing  o Lack of sharing information and reduced customer services   * Infeasibility of applying manual methods where they can be harmful to humans * Emergence of ICT era   o Use of IT to overcome the drawbacks of manual methods of data manipulation   * Usage of information in various domains * Availability of technologies related to information retrieval and sharing * Development of computer networks, the Internet and WWW * Development of mobile communication, mobile computing and cloud computing | * Identifies the drawbacks of manual data processing * methods * Describes the importance of information in day to day life * Lists the available technologies related to information dissemination * Investigates the development of computer networks, the Internet and WWW * Describes the development of mobile communication, mobile computing and cloud computing * Appreciates the use of technology to create, disseminate and manage, data and information * Recognizes the usage of information in various domains * Investigates the safety issues of human operators in various applications | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 1.3  Formulates an abstract model of information creation and evaluates its compliance with ICT | * Abstract model of information creation   o Input, process, output  o Its appropriateness to Computer and ICT | * Identifies the components of an abstract model of information creation * Defines a system * Analyses various systems using the system definition * Relates the abstract model to information systems * Matches the abstract model of information creation to the main functions of the computer * Recognizes the role of ICT in the abstract model of information creation | 2 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 1.4  Selects and classifies the basic components of a computer system | * Hardware   o Classification of hardware components   * Software   o Classification of software   * Human Operators   o Need of human operators in information systems | * Defines and classifies hardware and software components * Distinguishes proprietary software and open source software * Describes the advantages and disadvantages of proprietary and open source software * Identifies the role of human operators in the ICT enabled information systems | 2 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 1.5  Analyses the activities of data processing | * Steps in data processing:   o Data gathering  o Data validation  o Data processing  o Data output  o Data storage   * Data gathering methods   o Manual methods  o Semi-automated and  automated methods   * Tools - (OMR, OCR, MICR, card/tape readers, magnetic strip readers, bar code readers, sensors and loggers) * Data validation methods   o Data type check  o Presence check  o Range check   * Modes of data input   o Direct and remote  o Online and offline   * Data processing   o Batch and real time   * Output methods   o Direct presentation to the user  o Storing for further processing   * Storage methods * Local and remote storage (cloud) * Short and long term storage | * Lists and briefly describes the data processing steps * Identifies data gathering methods * Identifies data validation methods * Lists data input methods * Describes data processing methods * Lists data output methods * Describes data storage methods | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 1.6  Investigates the application of ICT in different domains | * Application of ICT in:   o Education  o Healthcare  o Agriculture  o Business and finance  o Engineering  o Tourism  o Media and journalism  o Law enforcement | * Identifies appropriate tools, skills and knowledge needed in different application domains * Discusses the benefits of ICT in different domains | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 1.7  Evaluates the impact of ICT in the society | * Benefits caused by ICT   o Social benefits  o Economic benefits   * Issues caused by ICT   o Social  o Economical  o Environmental  o Ethical  o Legal  o Privacy  o Digital divide   * Confidentiality * Stealing / Phishing * Piracy   o Copyright / intellectual property laws  o Plagiarism  o Licensed / unlicensed software | * Explains the benefits of ICT in terms of social and economic aspects * Explains briefly the issues caused by advancement of ICT in terms of social, economic, environmental, ethical and legal aspects * Investigates the legal situation connected with the usage of ICT * Explains the environmental issues associated with ICT * Explains safe disposal methods of e-waste * Explains briefly the ethical, Legal and social issues in the usage of ICT * Briefly explains the role of ICT in achieving Sustainable Development Goals (SDGs) * Investigates the approaches to eliminate digital divide | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| Competency 2:  Explores the evolution of computing devices, so as to be able to describe and compare the performance of modern computers | 2.1  Elicits the significant changes occurred in the computers from generation to generation with more emphasis on the evolution of processors | * History of computing   o Early calculating aids   * mechanical * electromechanical   o Electronic age of computing   * Generation of computers   o 1G, 2G, 3G, 4G and future   * Different types of classifications   o Technology   * analog, digital   o Purpose   * special /general   o Size   * super, mainframe, mini, micro (mobile devices –smart phones, tablet devices and phablets) | * Categorizes the early calculating aids with examples * Describes the generations of computers with their features in a table * Categorizes computers in terms of technology, purpose and size with examples | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 2.2  Explores the functionality of a computer in relation to the hardware and their interfaces | * Major hardware components   o Input devices: keyboard entry and direct entry (keyboard, pointing devices, touch pad, remote control, touch screen, magnetic strip reader, barcode reader, smart card reader, scanner, digital camera, microphone, sensors, graphic tablets, MICR, OMR and OCR readers, video camera, digitizer, web cam)   * Advantages of direct entry input devices over keyboard entry input devices * Output devices and their features (CRT monitor, TFT monitor, LED monitor, dot matrix printer, inkjet printer, laser printer, 3D printer, graph plotter, speakers) * CPU and its compatibility with motherboard * Storage devices( fixed internal hard disk, portable external hard disk, magnetic tape, Optical discs(CD Rom/DVD Rom, CD-R/DVD-R, CD-RW/ DVD-RW, DVD-RAM, Blu-Ray) flash memory card, mini disk) * Parallel and grid computing | * Identifies hardware peripherals and their relevant interfaces * Identifies the advantages of direct entry input devices over keyboard entry input devices * Describes the evolution of CPU and its compatibility with motherboard * Categorizes the Storage devices * Briefly explains the features of each storage device * Identifies the need for parallel and grid computing | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 2.3  Explores the Von-Neumann Architecture | * Von-Neumann Architecture   o Stored program control  concept  o Components (input, output, memory, Processor control unit and processing ALU unit)   * Fetch-execute cycle * Central processing unit (CPU)   o Arithmetic and logic unit (ALU)  o Control unit (CU)  o Memory (Registers)  o Data and control bus  o Multi-core processors | * Describes the stored program concept * Names the major components of Von-Neumann architecture * Describes fetch-execute cycle * Briefly describes ALU, CU, Memory (Registers), data and control bus * Draws the Von-Neumann Architecture model and names its components * Describes the need of multi-core processors | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 2.4  Examines PC memory system to identify different types of memory and their main characteristics | * Memory hierarchy   o Need of memory hierarchy  o Comparison criteria   * Physical size / density of data * Access method * Access time (elapsed time/delay) * Capacity * Cost * Volatile memory and their characteristics   o Registers  o Types of cache memory  o Main memory – RAM  o Types of RAM   * SRAM, DRAM, SDRAM * Non-volatile memory and their characteristics   o Types of ROMs   * PROM, EPROM and EEPROM   o Secondary storage   * magnetic, optical and flash memory | * Briefly explains the memory hierarchy with a suitable diagram * Describes the need for different types of memory and their characteristics * Briefly explains the volatile and non-volatile memory * Lists volatile and non-volatile memories in computer * Describes the characteristics of memory in terms of performance, location, capacity, access method, cost, physical type and physical arrangement of data (bits into words) * Lists and briefly explains the types and characteristics of ROMs * Compares and contrasts each type of memory in terms of access time, cost / MB, capacity (typical amount used) | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| Competency 3:  Investigates how instructions and data are represented in computers and exploit them in arithmetic and logic operations | 3.1  Analyses how numbers are represented in computers | * Need for instruction and data representation in digital devices * Methods of instruction and data representation in computers   o Representation of data in two states (0,1)   * Number systems used in computing   o Binary, octal, hexadecimal  o Conversion between number systems   * Representation of decimal numbers (signed and unsigned)   o Signed integer representations   * Signed magnitude * One’s complement * Two’s Complement | * Describes that instruction and data are represented using two states in computers * Explains the need of different number systems * Describes how different types of decimal numbers are stored in computers * Converts decimal integers into binary, octal and hexadecimal numbers and vice versa * Converts binary numbers to octal and hexadecimal, and vice versa * Converts octal numbers to binary and hexadecimal, and vice versa * Explains that the MSB is used to indicate the sign when converting the given binary value to one’s complement * Converts the given binary value to two’s complement * Explains the usage of one’s complement and two’s complement | 10 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 3.2  Analyses how characters are represented in computers | * Methods of character representation   o BCD  o EBCDIC  o ASCII  o Unicode | * Lists the methods of character representation in computer * Converts given symbols into a representation scheme * Describes the advantage and disadvantage of different data representation schemes | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 3.3  Uses basic arithmetic and logic operations on binary numbers | * Binary arithmetic operations - (integers only)   o Addition, subtraction   * Logical operations   o Bitwise logical operations | * Works out additions (multiple numbers with or without carryovers) – in binary numbers * Works out subtraction (with or without borrowing) – in binary numbers * Works out NOT, AND, OR, XOR bitwise operations | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| Competency 4:  Uses logic gates to design basic digital circuits and devices | 4.1  Analyzes basic digital logic gates in terms of their unique functionalities | * Digital logic gates and truth tables   o Basic logic gates   * NOT, AND, OR, and XOR   o Combinational gates   * NAND, NOR, and XNOR   o Universal gates   * NAND, NOR | * Names basic logic gates and draws the appropriate symbols of them * Draws the truth tables for the basic logic gates * Identify symbols that represent negations of basic logic gates * Creates truth tables for given expressions (maximum three inputs) * Explains the need of universal gates * Explains the fabrication of any gate using universal gates | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 4.2  Simplifies logic expressions using laws of Boolean algebra and Karnaugh map | * Two state logic and Boolean Algebra * Postulates (Axioms) * Laws/theorems   o Commutative, associative   * Distributive   o Identity, redundancy  o De Morgan’s   * Standard logical expressions   o Sum of products and product of sums  o Transform SOP into POS and vice versa   * Simplify logic expressions using   o Boolean theorems  o Karnaugh map | * Describes the need for simplifying Boolean expressions * Represents logical expressions in standard forms (SOP and POS) according to the given truth table * Transforms SOP into POS and vice versa * Simplifies logic expressions using Boolean theorems, axioms, De Morgan’s Laws and Karnaugh map | 8 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 4.3  Designs simple digital circuits using logic gates | * Truth tables and logic expressions for their designs (up to three inputs) * Digital circuit design | * Identifies situations to apply logic circuits in day to day life * Designs logic expressions and truth table for identified applications * Designs digital circuits | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 4.4  Explores how combinational Logic circuits are used in CPU and sequential circuits in physical memory | * Building blocks of CPU   o Half adder  o Full adder   * Storing bits in digital circuits   o Feedback loop  o Flip-flops | * Identifies the major building blocks of CPU * Creates truth table and logical expressions for half adder circuit * Creates truth table and logical expressions for full adder circuit * Briefly describes the usage of Flip-Flops | 6 | Teacher guide,  Internet, Activity sheets |  |  |  |
| Competency 5 :  Uses operating systems to manage the functionality of computers | 5.1  Defines the term computer operating system (OS) and investigates its need in computer systems | * Introduction to computer operating system * Evolution of OS * Main functions of an operating system   o Providing interfaces  o Process management  o Resource management  o Security and protection   * Classification of operating systems   o Single user – single task  o Single user – multi task  o Multi user – multi task  o Multi-threading  o Real time  o Time sharing systems | * Defines the computer operating system * Briefly describes the evolution of OS * Identifies the main functions and the abstractions (directories, files and data) provided by the operating system to the user * Describes how the operating system manages the resources of a computer * Classifies the operating systems based on their users and tasks | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 5.2  Explores how an operating system manages directories/folders and files in computers | * File types   o Need for file types (.exe, .jpg .txt etc   * Directory and file organization   o File hierarchy  o File systems – FAT etc   * File security   o Passwords and access privileges   * File storage management   o Storage allocation   * + - Contiguous allocation     - Linked allocation     - Indexed allocation * Defragmentation * Maintenance of secondary storage   o Need and outcome of disk formatting | * Describes files and directories * Briefly describes the need of disk formatting * Identifies the need for file types * Lists attributes of file and directories * Describes the structure of the file systems * Illustrates the organization of files and directories * Briefly describes the methods used in file security * Briefly describes how an operating system manages file security * Briefly explains * Contiguous allocation * Linked allocation * Indexed allocation * Describes defragmentation and explains how it occurs | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 5.3  Explores how an operating system manages processes in computers | * Definition of process * Interrupts and interrupts handling * Process management * Process states * Process Transitions * Process control block * Context switching * Process schedulers | * Explains processes * Lists the operating system tasks when a process is created * Lists the types of processes * Lists the process states * Explains process termination * Distinguishes a process and a program * Explains process states using the seven state process transition diagrams * Describes process schedulers and scheduling policies * Compares long, short and medium term schedulers * Describes multi programming and its needs * Describes time sharing systems * Compares multi programming vs. time sharing systems * Defines context switch * Briefly explains turnaround time, response time, throughput time and waiting time * Briefly explains the process control block and lists its contents | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 5.4  Explores how an operating system manages the resources | * Memory management   o Memory Management Unit (MMU)  o Physical Memory  o Virtual memory   * Input and output device management   o Device drivers  o Spooling | * Briefly explains the need of memory management and Memory Management Unit (MMU) * Briefly explains the virtual memory * Briefly explains paging and mapping * Briefly describes how an OS manages Input and output devices * Briefly describes device drivers * Briefly describes the need of device drivers * Briefly describes spooling * Installs appropriate device drivers when connecting a peripheral | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| Competency 6:  Explores the data communication and computer networking technologies to share information effectively | 6.1  Explores signals and their properties | * Signal Types   o Digital  o Analog   * Properties   o Amplitude  o Frequency  o Wave length  o Phase   * Propagation speed in a media | * Graphically represents digital and analog signals and their properties * Solves problems related to the relationship between signal properties | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 6.2  Explores signal transmission media | * Wires – Guided media (Twisted pair, coaxial cable, Fiber optics etc.) * Free space – Unguided media * Properties   o Latency  o Bandwidth  o Noise  o Attenuation  o Distortion   * Simple topology: point-to-point connection | * Classifies media as guided and unguided media * Describes how latency, bandwidth, noise, attenuation, and distortion affects signal transmission | 4 | Network cables, Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 6.3  Investigates how digital data is encoded using signal elements | * Agreeing on signal elements to represent data (a protocol)   o Two simple elements – two voltage levels (amplitudes)  o Other possibilities (briefly)   * + - Frequency     - Phase   o Changing speed of signal elements  o Need for synchronization   * Timing/Clocks * Manchester encoding   o Handling errors   * Example: Parity | * Graphically represents encoding of digital data using two voltage levels as well as Manchester encoding * Describes the possibility of using the changes in frequency and phase as signal elements * Explains the need for synchronization and describes the problems that arise when the transmitter and the receiver are not synchronized * Compares and contrasts the relationship between how fast the signal elements are changed and the bit rate in simple two voltage encoding and Manchester encoding Describes how the parity bit enables detecting a bit error | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 6.4  Explores the use of Public Switched Telephone Network (PSTN) to connect two remote devices | * Public Switched Telephone Network   o Providing a circuit between two points that can carry analog voice   * Modulation, Demodulation and Modems   o Encoding data using analog signal elements   * Connecting two devices using Modems | * Describes a PSTN as an analog voice carrying line * Describes how modems modulate analog signals so that they can be sent along a PSTN line * Draws a schematic diagram depicting two computers connected using modems via a PSTN line | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 6.5  Investigates how the problem of connecting multiple devices into a network is addressed | * All-to-all connections are impractical * A solution: Bus Topology   o Simple  o Problem: Controlling access to the bus (media)   * Other topologies   o Star  o Ring  o Mesh   * Simplifying wiring   o Hubs  o Switches | * Demonstrates the impracticality of connecting large number of devices in all-to-all topology * Demonstrates the simplicity of a Bus * Draws diagrams of different topologies * Describes the use of Hubs and Switches to simplify the wiring of a network and compares/contrasts |  | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 6.6  Explores the role of Media Access Control (MAC) protocol | * Local Area Network (LAN) * Identifying devices   o Addresses – MAC addresses   * Frames * Orderly access to the media   o Very simple protocol as an example – ALOHA  o Improvements from ALOHA to Ethernet   * Broadcasting and Uni -casting messages | * Describes the need to uniquely name devices (addresses) so that the sender and the receiver can be identified * Explains the role of frames as the unit of transmission * Describes the need of a protocol to ensure orderly access to media with respect to a bus * Briefly describes the evolution of MAC protocols from ALOHA to Ethernet | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 6.7  Explores how the multiple networks are interconnected to form the Internet | * A device to connect two or more networks – gateway * Need for globally unique uniform addressing independent of MAC addresses and LAN technology   o IPv4 addresses  o Assigning IPs to networks   * + - Sub-netting     - Subnet masks     - CIDR notation     - Private IP addresses     - DHCP   o Scarcity of IPv4 addresses and IPv6 as a solution(an overview)   * Finding the path to the destination   o Routing and routers  o Packet switching   * Best effort delivery | * Explains the role of a gateway device in inter connecting two LANs * Explain the need for a uniform, MAC protocol independent addressing scheme and how IP addresses play that role * Describes the role of subnet masks * Calculates subnet masks and IP address ranges for a given block of IP addresses and network sizes * Describes how DHCP is used to dynamically assign IP addresses * Describes the role of routers in finding a suitable path from the sender to the receiver * Explains packet switching and best effort delivery in IP networks | 6 | Teacher guide, Internet Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 6.8  Explores the role of transport protocols in the Internet | * Delivering data from an application process to another application process   o Multiple applications at a host identified by an IP   * Multiplexing – multiple end points at the same IP   o Ports and port numbers  o UDP   * Properties * Applications   o TCP   * Properties * Applications | * Explains that it is not sufficient to deliver a message from one IP address to another by demonstrating that the communication is from process to a process * Explains the need for multiplexing messages and how port numbers identify the end points * Briefly describes the functionality of UDP and lists applications that use it * Briefly describes the functionality of TCP and lists applications that use it | 4 | Teacher guide, Internet Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 6.9  Explores some applications on the Internet | * Domain Name System (DNS)   o IP addresses are hard to remember  o Human friendly names  o Hierarchical name space  o Each domain is responsible for managing the names under it  o Top level domains   * HTTP * Client Server model | * Describes the need for human friendly names instead of IP addresses * Explains the role of DNS in translating names to IP addresses * Graphically represent the hierarchical and distributed structure of the DNS * Describes a simple GET request and its response in HTTP * Describes the client server model using DNS and HTTP | 4 | Teacher guide, Internet Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 6.10  Investigates the role of reference models to describe the network architecture | * TCP/IP model   o Application  o Transport  o Internet  o Host to network   * OSI model   o Application  o Presentation  o Session  o Transport  o Network  o Data link  o Physical | * Describes the functions of layers of TCP/IP and OSI models * Describes the data units in different layers (packet, frame and bit) * Describes the data flow in a network using TCP/IP and OSI models | 4 | Teacher guide, Internet Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 6.11  Investigates the security aspects of the communication and protection of devices connected to the Internet | * Encryption and digital signature – basic idea   o Public Key  o Private Key  o Signing   * Threats   o Viruses  o Trojans  o Malware  o Phishing   * Protection   o Firewalls  o Antivirus software  o Education/ better awareness/ good practices | * Identifies the need for confidentiality and authentication of messages and notes that the Internet does not provide * Briefly explains the use of the public and private keys to encrypt and sign messages * Describes different threats faced by networked systems and protection against them | 4 | Teacher guide, Internet Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 6.12  Explores the role of ISPs and technologies used for connecting Home Networks to the Internet | * ISPs * Connecting to ISP   o Modems  o DSL/ADSL   * A home LAN that uses private IPs   o Network Address Translation /Proxies | * Describes the role of an ISP * Explains the use of modems and dialup lines to connect a home machine to an ISPs network * Explains the advantages of DSL/ADSL lines * Explains the roles of NATs and Proxies in a LAN that uses private IPs | 4 | Teacher guide, Internet Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| Competency 7:  Explores the systems concept and uses systems analysis and design methodology in developing information systems | 7.1  Explores Characteristics | * System concept * Classification of systems   o Open and closed systems  o Natural and manmade systems  o Living and physical systems | * Recalls the definition of systems * Lists and describes the characteristics of systems * Classifies and describes systems with examples | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.2  Compares and contrasts different types of manmade systems in terms of their objectives and functionality | * Information systems   o Office Automation Systems (OAS)  o Transaction Processing Systems (TPS)  o Management Information Systems (MIS)  o Decisions Support Systems (DSS)  o Executive Support Systems (ESS)  o Geographical information systems (GIS)  o Knowledge Management Systems (KMS)  o Content Management Systems (CMS)  o Enterprise Resource Planning Systems (ERPS)  o Smart systems | * Compares the objectives and functionality of different types of manmade systems * Distinguishes the different types of manmade systems in terms of objectives and functionality | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.3  Explores different information system development models and methods | * System development models   o Waterfall  o Spiral  o Agile  o Prototyping   * Rapid Application Development (RAD) * System development methodologies   o Structured  o Object Oriented | * Lists and briefly describes system development models * Investigates the applicability of each model * Lists and describes the stages of System Development Life Cycle (SDLC) in Waterfall model * Lists and describes phases of the SDLC in Spiral model * Lists and briefly describes system development methodologies | 8 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.4  Examines the Structured System Analysis and Design Methodology (SSADM) | * Introduction to SSADM * Stages of the system development life cycle | * Defines SSADM * Lists and briefly describes the stages of SDLC covered by SSADM | 2 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 7.5  Investigates the need for a new information system and its feasibility | * Preliminary investigation   o Identification of the problems in the current system  o Suggest alternative solutions  o Prioritizing information systems needs   * Feasibility study   o Technical feasibility  o Economic feasibility  o Operational feasibility  o Organizational feasibility | * Describes the tasks in preliminary investigation stage * Identifies information problems in an organization * Identifies priorities of the problems to be solved * Describes the need of feasibility study * Lists and briefly describe the types of feasibility | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.6  Uses different methods to analyze the current system | * Requirement analysis   o Functional requirements  o Non – functional requirements   * Analytical Tools   o Business Activity Modeling   * Business activity model * o Data Flow Modeling (DFM) * Data Flow Diagrams (DFD) * Elementary processes and Elementary Process Descriptions (EPD) * Document flow diagram   o Logical Data Modeling (LDM)   * Logical Data Structure (LDS) * Business System Options (BSO) | * Describes the need for requirement analysis * Describes type of requirements with examples for a given system * Defines requirements in IEEE standard * Lists the analytical tools and describes the purpose of them * Draws business activity model, context diagram, document flow diagram, data flow diagrams and logical data structure for a given system * Writes elementary process descriptions * Describes the need for business system options * Proposes business system options * Selects the most appropriate business system option | 18 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.7  Designs the proposed system | * Logical design tools   o Logical Data flow modeling   * Logical Data flow diagrams for proposed system * Elementary processes and elementary process description * User Interface design   o Logical Data modeling   * Logical data structure for the proposed system   o Physical design of database   * Table and record specifications * Data dictionary * Database design | * Describes the logical design   Describes the activities involve in the logical design stage   * Reconstructs logical design of the proposed system starting from elementary processes to context diagram * Writes elementary process description in pseudo code * Specifies table and record specifications | 14 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
|  | 7.8  Develops and tests the proposed system | * Program development * Database development * Testing   o Test cases  o White box testing  o Black box testing  o Unit testing  o Integrated testing  o System testing  o Acceptance testing | * Lists the testing methods for a newly designed system * Describes the testing methods for a newly designed system | 6 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.9  Deploys the developed system | * Deployment methods   o Parallel  o Direct  o Pilot  o Phase   * Hardware/Software installation, data migration and user training * Review, support and maintenance | * Describes the methods of deployment of the developed system. * Describes the activities involved after implementation of a system | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |
| 7.10  Describes system implementation with off-the-shelf packaged systems | * Advantages and disadvantages of using off- the-shelf packages * Identification of package capabilities, work flows etc. * Business process gap analysis * Business process mapping * Business process reengineering | * Describes the costs and benefits of off-the-shelf packages in terms of investment, operational and maintenance cost * Describes the features and capabilities of packaged solutions related to standard business applications * Identifies and describes differences between a given business process and features of off-the-shelf packages * Maps business process activities onto work flow of the off-the-shelf packaged solution * Identifies changes required in the current business process * Identifies customization requirements of off-the-shelf packaged solutions | 4 | Teacher guide, Multimedia projector, Pre prepared presentations, Activity sheets |  |  |  |

Date :- ……………………........ ……………………........ Signature of the Principal