

SKILL ENHANCEMENT COURSES

SYLLABUS FOR THE

SUBJECT: COMPUTER MAINTENANCE (VOCATIONAL)

for the award of the Degree in

BACHELOR OF ARTS/ BACHELOR OF SCIENCE/HONOURS

(Offered under 4-year UG Degree Programme)

(Credit Based Grading System)
under NEP 2020

Batch: 2025–29



GURU NANAK DEV UNIVERSITY AMRITSAR

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Skill Enhancement Courses in Computer Maintenance (Vocational)
(CBGS) (under NEP 2020) (Batch 2025-29)

SCHEME

COMPUTER MAINTENANCE (VOCATIONAL)

SKILL ENHANCEMENT COURSES (SEC)

SEC-I

Sr. No.	Course Code	Course Title	Credits L - T - P	Total Marks
1.		DIGITAL ELECTRONICS (THEORY)	3 - 0 - 0	75

SEC-II

Sr. No.	Course Code	Course Title	Credits L - T - P	Total Marks
1.		ASSEMBLY LANGUAGE BASICS (THEORY)	2 - 0 - 0	50
2.		ASSEMBLY LANGUAGE BASICS (PRACTICAL)	0 - 0 - 1	25

SEC-III

Sr. No.	Course Code	Course Title	Credits L - T - P	Total Marks
1.		COMPUTER NETWORKS AND INTERNET (THEORY)	2 - 0 - 0	50
2.		COMPUTER NETWORKS AND INTERNET (PRACTICAL)	0 - 0 - 1	25

COMPUTER MAINTENANCE (VOCATIONAL)

SKILL ENHANCEMENT COURSES

SEC-I

DIGITAL ELECTRONICS

(THEORY)

Time: 3 Hours

Credits

L-T-P

3-0-0

Max. Marks: 75

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A

Introduction to Electronics: Voltage Source, Current Source, Electronic Components, CRO, Digital Multimeter.

Network Theorems: Thevenin's Theorem, Maximum Power Transfer Theorem, Norton's Theorem, Power Supplies.

SECTION–B

Semiconductor Devices: P–N Junction, Zener Diode, LEDs, Photodiodes, Transistors, Field Effect Transistor, Metal Oxide Field Effect Transistor.

SECTION–C

Digital Logic Fundamentals: Number Systems, conversions between number systems, Logic Gates, Boolean algebra, Karnaugh maps.

SECTION-D

Digital Logic Circuits: Multiplexers, Demultiplexers, Encoders, Decoders, Flip–Flops, Counters, Shift Registers, Semiconductor Memories.

References:

1. NN Bhargava, Basic Electronics and Linear Circuits, Tata McGraw Hill, 2004.
2. V.K. Mehta, Principles of Electronics, S. Chand, 2004.
3. Malvino, Digital Computers Electronics, Tata McGraw Hill, 3rd Edition, 1995.

COMPUTER MAINTENANCE (VOCATIONAL)

SKILL ENHANCEMENT COURSES

SEC-II

ASSEMBLY LANGUAGE BASICS

(THEORY)

Time: 3 Hours

Credits

L-T-P

2-0-0

Max. Marks: 50

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

Introduction to Assembly Language: Basics of mnemonics, opcodes, and operands.

Assembly vs High-Level Languages: Use cases and applications. Writing Assembly Programs: Program structure, defining data and code segments

SECTION-B

Data Movement Instructions: MOV, PUSH, POP, etc.

Arithmetic Instructions: ADD, SUB, MUL, DIV.

Logical Instructions: AND, OR, XOR, NOT.

Control Flow Instructions: JMP, LOOP, CALL, RET.

Stack and Subroutines: Basics of stack operations and subroutine calls.

SECTION-C

Debugging Tools: Use of simulators/debuggers (e.g., TASM, MASM, or emulators).

Optimization Techniques: Efficient use of registers and instructions.

SECTION-D

Basic I/O Port Programming: Reading from and writing to ports, Interfacing with Peripherals: LEDs, switches, seven-segment displays,

Simple Applications: Implementing a counter, traffic light controller.

Recommended Books and Materials:

1. Introduction to 8085 Microprocessor and Assembly Language Programming by Ramesh Gaonkar.
2. Assembly Language Programming and Organization of the IBM PC by Ytha Yu and Charles Marut.
3. The Art of Assembly Language by Randall Hyde.
4. Online resources like tutorials and videos on MASM/TASM or open-source assembly simulators.
5. User manuals for microprocessors (8085/8086).

COMPUTER MAINTENANCE (VOCATIONAL)

SKILL ENHANCEMENT COURSES

SEC-II

ASSEMBLY LANGUAGE BASICS

(PRACTICAL)

Max. Marks: 25

Credits
L-T-P
0-0-1
2hrs/week

1. TASM/MASM setup.
2. To perform arithmetic operations on decimal numbers.
3. To perform arithmetic operations on binary numbers each of 16-bit long.
4. To perform arithmetic operations on binary numbers each of 8-bit long.
5. To perform bitwise operations (AND, OR, XOR, NOT, shift left, shift right) on an integer.
6. To find maximum number of three numbers and store it at location 0510.
7. To count the number of 1 bits (Hamming weight) in a given integer.
8. To display 9 stars on the screen along with a simple message
9. To print the numbers 1 to 9 on the screen
10. Keyboard Input: Basic keypad interfacing and input handling.
11. Implement a simple encryption and decryption system using the XOR cipher.
12. Implement stack operations

**COMPUTER MAINTENANCE (VOCATIONAL)
SKILL ENHANCEMENT COURSES
SEC-III
COMPUTER NETWORKS AND INTERNET
(THEORY)**

Time: 3 Hours

Credits

L-T-P

2-0-0

Max. Marks: 50

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

Introduction, Objectives - Why Computer Networks?, The Topologies – Bus, Ring, Star, Mesh, Combined topologies; Types of Networks -Local Area Networks (LANs), Metropolitan Networks (MANS), Wide Area Networks (WANs); transmission mode - simplex, half duplex and full duplex; Transmission Media – guided and unguided - Cables, Microwave Link, Fiber optic Link, Radio Frequencies (RF), Infrared Wireless; Connecting Devices – Repeaters, Hubs, Bridges, Routers, Gateways;

SECTION-B

Problems in Computer Communication: Need for IP Address, Classes of IP Address, Who Decides the IP Addresses, Need of Protocol on Communication, Dealing with Incompatibility; OSI Model and Communication between Systems; Data Link Layer Design Issues: Services provided to Network layer, Framing, error control, flow control, link management. Error detection & correction. Design Issues of Network Layer: Services provided to transport layer, routing, connection.

SECTION-C

TCP/IP Layers and Protocols - Network Access Layer, Internet Layer - Address Resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP); Transport Layer - Transmission Control Protocol, User Datagram Protocol (UDP); Application Layer - Electronic Mail; Domain Name System (DNS); How does the DNS Server Works?, Simple Network Management Protocol (SNMP), Remote Login: TELNET; World Wide Web: HTTP

SECTION-D

Origin of the Internet, Architecture of the Internet, The Internet & World Wide Web; terminology: web pages, website, web browser, web server, bandwidth; Connect to the Internet: hardware and software, types of Internet connections, Internet Service Providers; Navigating different types of websites and online resources.

Recommended Books and Materials:

1. Douglas E Comer, The Internet Book: Everything You Need to Know About Computer Networking and How the Internet Works, CRC Press

COMPUTER MAINTENANCE (VOCATIONAL)

SKILL ENHANCEMENT COURSES

SEC-III

COMPUTER NETWORKS AND INTERNET

(PRACTICAL)

Max. Marks: 25

Credits
L-T-P
0-0-1
2hrs/week

- 1 Demonstration of LAN-client/server model and peer to peer network ,
- 2 Demonstration and installation of networking cables co-axial , twisted pair, optic fibre, crimping of cables straight cable , cross cable , RJ 45
- 3 Demonstration and installation of networking components Modems, routers, switches, Hubs, Wireless Routers
- 4 Installation of Network card in system and connecting system in LAN
- 5 User creation
- 6 Using basic Networking commands- like ping, IP Config, etc
- 7 Installation and working of Video teleconferencing
- 8 Installation and working of Security cameras (CCTV)
- 9 Using the application layer protocols
 - a. To transfer files between computers, e.g. FTP, TFTP, HTTP
 - b. To have remote access to computing resources e.g. Telnet, Remote login, Secure Shell to support communication between users at different hosts.
 - c. Email
- 10 To browse and search the internet