மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்

MANONMANIAM SUNDARANAR UNIVERSITY

SYLLABUS FOR DIPLOMA IN COMPUTER HARDWARE & NETWORK
MAINTENANCE PROGRAM OFFERED THROUGH DIRECTORATE OF
VOCATIONAL EDUCATION (COMMUNITY COLLEGES AND VOCATIONAL SKILL
DEVELOPMENT CENTRES) FROM 2019 – 2020

கல்விசார் நிலைக்குழுக் கூட்டம்

MEETING OF THE STANDING COMMITTEE ON
ACADEMIC AFFAIRS HELD ON WEDNESDAY
THE 22nd JANUARY 2020

DIPLOMA IN COMPUTER HARDWARE & NETWORK MAINTENANCE

கணினி வன்பொருள் மற்றும் வலைப்பின்னல் பராமரிப்பு பட்டயம்

SCHEME OF EXAMINATION

Subject code	Title of the Course	Credits	Hours	Passing Minimum
Semester I				
C19CN11/E19CN01	Computer Fundamentals	6	90	40/100
C19CN12/E19CN02	Basics of Computer Hardware	6	90	40/100
C19CN13/E19CN03	System Assembly & Troubleshooting	6	90	40/100
C19CE10/E19CE10	Communicative English	6	90	40/100
C19CNP1/E19CNP1	Practical I-Computer Hardware	4	120	40/100
Semester II				
C19CN21/E19CN04	Basics of Networking	6	90	40/100
C19CN22/E19CN05	Network Protocols and Modelling	6	90	40/100
C19LS23/E19LS05	Life Skill	6	90	40/100
C19CNP2/E19CNP2	Practical II-System & Troubleshooting	4	120	40/100
C19CNPW/E19CNPW	Project Work	10	150	40/100

Eligibility for admission: Pass in 10th std examination conducted by the Govt. of Tamil Nadu Board of Secondary Education, Government of Tamil Nadu or any other equivalent examination.

Examination: Passing Minimum for each Course is 40%. Classification will be done on the basis of percentage marks of the total marks obtained in all the Courses and as given below:

40 % but less than 50 %   - Third class
50 % but less than 60 %   - Second class
60 % and above   - First class

Theory Paper

Internal Marks-25
External Marks-75

SYLLABUS

Semester I

Course I	-	Computer Fundamentals
Course II	-	Basics of Computer Hardware
Course III	-	System Assembly & Troubleshooting
Course IV	-	Communicative English
Course V	-	Practical I-Computer Hardware

Semester II

Course VI	-	Basics of Networking
Course VII	-	Network Protocols and Modelling
Course VIII	-	Life Skill
Course IX	-	Practical II-System & Troubleshooting
Course X	-	Project Work

*(Semester Pattern for Community College Only)

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Program Objectives

- Entrepreneurship Development (Compulsory for all two years diploma, one year diploma and certification courses)

- Entrepreneurship Development.

(C19CN11/E19CN01) Computer Fundamentals

Objectives
- To understand the concepts of computer basics.
- To learn the organization and operation of a computer processor, primary and secondary memory and peripheral devices.
- To obtain knowledge on database management.

Unit I: **18 Hrs**

Introduction to Computers: Introduction – Characteristics of Computers – Evolution of Computers – Generation of Computers – Classification of Computers – Application of Computers.

Unit II: **18 Hrs**

Input Devices: Keyboard – Pointing Devices – Webcam – Scanners – Optical Character Recognition – Optical Mark recognition – Magnetic Ink Character Recognition – Bar Code Reader.

Output Devices: Printers – Plotters – Computer Output Microfilm – Monitors – Voice Recognition System – Projectors.

Unit III: **18 Hrs**

Primary memory: Memory Representation – Memory Hierarchy – Random Access Memory – Read only memory – Types of ROM.

Secondary Storage: Classification of Secondary Storage Devices – Storage Organization of Magnetic Disk – Storage Organization of Optical Disk – Magneto-Optical Disk – Universal Serial Bus.

Unit IV: **18 Hrs**

Database Fundamental: Data, Information and Knowledge – Database – Logical Data Concepts – Physical Data Concepts – Database Management System – Need, Benefits of DBMS, Components of DBMS, Database Administrator – DBMS Architecture – Database Models.

Unit V: **18 Hrs**

Basic of Printers: Types of printers and printing mechanism- How printer works- Inject printer- working of laser printer- Trouble shooting printers.

Reference Books:
1. Introduction to Computer Science, ITL Education Solutions Limited, 2/e, Pearson, 2011.
2. Introduction to Computers, Peter Norton, 7/e, TMH, 2013.
3. Modern All about printers, Manohar Lotia, PradeepNair, Bijal Lotia BPB Publications, 2012.

Course II

(C19CN12/E19CN02)Basics of Computer Hardware

Objectives
- To familiarise with various number systems and their conversions.
- To understand the various types of specialized input and output devices.
- To develop programming skills using 8085 microprocessor.

UNIT I: **18 Hrs**

Number systems – Decimal, Binary, Octal, Hexadecimal – Conversions– LOGIC GATES – Universal GATES – NAND – NOR – Karnaugh maps – Tabulation and Simplifications-Basics of Sequential and Combinational logic – Multiplexer and De-multiplexer basics – GRAY code – ASCII code representation.

UNIT II: **18 Hrs**

Introduction to Memories – Types of memories – Registers – Caches – Primary and Secondary memory – Associative memory – Virtual memory– Optical discs – Flash memory systems.

UNIT III: **18 Hrs**

Basic computer hardware architecture – Functional units – Instruction formats – types – Addressing modes - Basic I/O devices – Keyboard – Console systems – Mouse – Printer – plotters – Scanners – Basic CPU architecture – Introduction to workstations network computers.

UNIT IV: **18 Hrs**

Standards in PC Architecture- PC/AT System Configuration-Bus Standards – System Bus - Communication Interface – Plug and Play Systems.

Unit V: **18 Hrs**

Hardware and Software diagnostic tools – Benchmarks- Introduction to 8085 microprocessor-Internal Architecture, Pin Layout - Interfacing – Memory – Instruction Set of 8085 - Addressing modes - Basic programming using 8085.

Reference Books:
1. Charles H. Roth Jr. Fundamentals of Logic design – 4th edition – Jaico publishing house, 2011.
2. Carl Hamacher.V., Zvonko G. Vranesic, Safwat G.Zaky "Computer organization" TMH, 2010.
3. Gaonkar – Micro Processor Architecture programming and application with 8085, Penram International Publishing; 6th edition, 2013.
4. Govindarajulu.B, IBM PC and Clones Hardware trouble shooting and maintenance Tata McGraw-Hill, New Delhi, 2012.

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Course III

(C19CN13/E19CN03) System Assembly & Troubleshooting

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Objectives

- To learn various troubleshooting rules and understand common problems.
- To understand bus, memory troubleshooting methods.
- To install and troubleshoot printer.

Unit I: 18 Hrs

Troubleshooting General PC Problems – Introduction- General Troubleshooting rules - Common Problems & Solutions- Preventive Maintenance.

Unit II: 18 Hrs

BIOS: Typical Motherboard BIOS, BIOS Features, BIOS & Boot Sequences, BIOS Shortcoming & Compatible Issues, BIOS Troubleshooting, BIOS Upgrades.

Unit III 18 Hrs

Hard Disk: Introduction - Disk Basics - Disk Performance & Characteristics - Drive Construction - Drive Testing & troubleshooting.

Motherboard & Buses: Introduction, Motherboard Components, Expansion Slots system Bus Functions & Features. Upgrading & Troubleshooting Motherboard, General Bus Troubleshooting.

Unit IV 18 Hrs

Basic Memory Concepts: Introduction - Installing Memories - Upgrade Options & Strategies - Replacing Memories with Higher Capacity - Troubleshooting Memory.

Unit V 18 Hrs

Printers: Printer Technology - How Printer Works - Attaching Printer - Installing Printer Drivers - Preventive Maintenance - Common Printer Problems & Solution – Error Code - Beep Code - Post Code - Post Reader Card.

Reference Books:
1. Upgrading & Repairing PCs: Muller – Prentice Hall – 10th Edition, 2010.
2. Complete PC Upgrade & Maintenance Guide: Mark Minasi–BPB Publishers–15th Edition, 2014.

(C19CE10/E19CE10)Communicative English

1. **Basic Grammar**:
   a. Review of grammar
   b. Remedial study of grammar
   c. Simple sentence
   d. Word passive voice etc.

2. **Bubbling Vocabulary**:
   a. Synonyms
   b. Antonyms
   c. One – work Institution

3. **Reading and Understanding English**
   a. Comprehension passage
   b. Précis – writing
   c. Developing a story from hints.

4. **Writing English**
   a. Writing Business letters.
   b. Paragraph writing
   c. Essay writing
   d. Dialogue writing

5. **Speaking English**
   a. Expressions used under different circumstances
   b. Phonetics

Reference:

1. V.H.Baskaran – "English Made Easy", "English Composition Made Easy", Shakespeare Institute of English Studies, Chennai.

2. N.Krishnaswamy – "Teaching English Grammar", T.R.Publication,Chennai.

3. P.Ravi, S.Prabakar and T.Tamzil Chelvam- "Life Skill", M.S. University, Tirunelveli.

(C19CNP1/E19CNP1) Practical I
Computer Hardware

List of Experiments

1. Connecting & disconnecting computer components & driver installation.

2. Hard disk partitioning and formatting.

3. OS installation like Windows, Linux.

4. OS installation like FAT, NTFS.

5. Internal component assembling and dissembling.

6. Basic trouble shoots using beep Sound.

7. Dual OS installation.

8. Assigning and identifying valid IP Addresses.

9. Configure network computers using switch.

10. Installation of Network Interface Card (NIC).

(C19CN21/E19CN04) Basics of Networking and Management

Objectives

- To understand various communication models
- To learn the concepts of protocol layers and various switching networks
- To study network service management and administration

Unit I: **18 Hrs**

Introduction to Computer Networks - Fundamentals of Network Communication- Communication model - Data communications networking – Data transmission concepts and terminology - Protocol architecture - Protocols - OSI - TCP/IP - LAN architecture Topologies - MAC - Ethernet, Fast Ethernet- Token ring - FDDI- Wireless LANS.

Unit II: **18 Hrs**

Network layer - Switching concepts - Network Switches - Wireless Access points - Network Interface Cards – Routers- Circuit switching networks - Packet switching - Routing - Congestion control - IP - Unreliable connectionless delivery - Datagram's - Routing IP datagram's - ICMP.

Unit III: **18 Hrs**

Transport layer - Reliable delivery service - Congestion control - connection establishment – Flow control - Transmission control protocol - User datagram protocol.

Unit IV: **18 Hrs**

Applications & Server Management and Administration - Sessions and presentation aspects – DNS – Telnet – rlogin - FTP - SMTP – WWW Basics of Firewalls Managing User and Group Accounts - Storage and file System Management, Working with Shared files and Printers, Monitoring system Reliability and performance, Backup and Fault tolerance.

Unit V: **18 Hrs**

Frame Relay - Packet switching networks - Frame Relay networks, Asynchronous transfer mode ATM protocol Architecture - ATM Logical connection - ATM cells - ATM service categories.

Reference Books:
1. Computer Networks, Andrew S Tanenbaum, Publisher- PHI, New Delhi, 2010.
2. B. A. Fourozan, TCP/IP Protocol Suite, Tata McGraw Hill, 2011.
3. Internetworking with TCP/IP, Douglas E. Comer, Publisher- PHI, New Delhi, 2013.
4. Gregory Tomsho, "Guide to Networking Essentials 6e", Cengage Learning, 2010.

Course VII
(C19CN22/E19CN05) Network Protocols and Modelling Technologies

Objectives
- To build an understanding of the fundamental concepts of computer networking and topologies.
- To introduce the student to networking concepts and protocols.
- To impart a knowledge on wireless technologies.

Unit I: 18 Hrs

Detailed Layered architecture of OSI: Introduction to various LAN and WAN Protocols - Network Address- Overview - Type of Addresses- Need- advantages and disadvantages. Network Topologies and Technologies – Bus - Star- Ring - Point -to-point - Ethernet networks and Standards – WIFI - Token Ring Networks - Wireless Access Point - Advanced features of NIC.

Unit II: 18 Hrs

ARP/RARP: Resolution - Packet format mapping and encapsulation - Internet protocol Virtual network- Connectionless – unreliable- Packet Delivery System. Datagram format- Datagram size- Network MTU and fragmentation- Time stamp option- IP Routing algorithm IP Checksum- ICMP and IGMP - Introduction and message format.

Unit III: 18 Hrs

IP & UDP: IP Addresses- Class Full Addressing- Network ID- Host ID Special Addressing – Sub netting and Super netting. Introduction to User Data gram Protocol- Format of UDP Message- Pseudo Header- Multiplexing & Demultiplexing- TCP- Introduction to Transmission Control Protocol- Ports- Collections and Endpoints- TCP Segment Format- Checksum Computation - Establishing a TCP Connection.

Unit IV 18 Hrs

Vector Distance & link state routing protocol - Routing Information Protocol -Open SPF Protocol - Gateway to Gateway Protocol - Hardware Broadcast - Hardware Multicast IP Multicast and Address Mapping - IP Multicast to Ethernet Multicast.

Unit V: 18 Hrs

Basics, hardware and Software Requirement for wireless network - Types of wireless network - Wireless technologies - Wireless networking standards -Application of wireless network.

Reference Books:
1. Hardware and networking by Vikas Gupta Publisher: Dream tech press, 2012
2. Introduction to Networking by Richard McMohan Publisher Tata Mcgraw Hills Ltd, India, 2014.
3. Michael Parmer, "Hands On Networking Essentials", Cengage Learning, 2013.

Course VIII

(C19LS23/E19LS05) Life Skill

I Life Coping or adjustment

   (a) External and internal influence in one's life

   (b) Process of coping or adjustment

   (c) Coping with physical change and sexuality

   (d) Coping with stress, shyness, fear, anger far live and criticism.

II   Attitude

   (a) Attitude

   (b) Self acceptance, self – esteem and self actualization

   (c) Positive thinking

III Problem Solving

   (a) Goal Setting

   (b) Decision Making

   (c) Time Management and stress Management.

IV Computers

   (a) Introduction to Computers

   (b) M.S.Office

   (c) Power Point

V Internet

   (a) Introduction to internet

   (b) E – mail

   (c) Browsing

References:

1) Life Skill Programme courses I & II by Dr. Xavier Alphona MCRDCE Publications. R.K.Mutt Road, Chennai – 28

2) ஆளுமை பண்பு வளர்த்தல் மற்றும் தகவல் தொடர்பு by M.Selvaraj Community College, Palayamkottai

3) "Life Skill" –P.Ravi, S.Prabahar & T.Tamil Chelvam, M.S. University, Tirunelveli

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Course IX

Practical II

(C19CNP2/E19CNP2)System & Troubleshooting

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List of Experiments

1. Switch Board Wiring and Testing.

2. Soldering and De-Soldering Practice.

3. Component Testing and Symbols.

4. Voltage Measurement of Different Circuits.

5. Testing and Measurement of SMPS.

6. Half wave, Full wave & Bridge rectifiers.

7. Assembling of a Computer.

8. Installation of different Operating Systems.

9. Installation of different device drivers.

10. Installation of different Application Software.

11. Biometric Security Device Installation and Configuration.

12. To Run All Dos Command (Internal and External Dos Command).

13. Assembling and Dissembling Of a Computer System.

14. Troubleshooting and Repair Operating System: Windows XP, Windows 7.

15. Installation and Troubleshooting of Printer (Dot-Matrix and Laser Printer).

16. Installation and Troubleshooting of Scanner (Photo & Bar Code Scanner).

17. To Repair and Troubleshooting of SMPS, Monitor, Printer and Motherboard.

Course X (C19CNPW/C19CNPW)
Project Work

- The students of this course are required to undertake a project individually on a specific topic during the 2nd semester and submit a report at the end of the semester but before but the commencement of the end semester examination.
- The objective of the project work is to understand the problems faced by the organization and offer specific suggestions to solve those problems.
- The students can undertake a project with specific problems related to computer hardware and networking and find solutions to overcome them

   The project report may contain the following.
   1. Certificate by the Guide
   2. Certificate of originality of work
   3. Acknowledgement, if any
   4. Introduction
   5. Objective
   6. Project Category
   7. Project Activity
   8. Tools/Environment used
   9. Program Structure/logic
   10. Coding
   11. Validation checks
   12. Table structure if any
   13. List of Report Queries
   14. Sample Report Layout
   15. References.

Entrepreneurship Development
Objectives
   ❖ To understand the nature of business development in the context of existing organizations and of new business start-ups.
Components
   1. Qualities of a good entrepreneur, Difference between small scale &large scale business, Market survey, Method of marketing, Publicity and advertisement, Marketing mix.
   2. Identification and selection of projects by a public survey and market study.
   3. Assessment of the fire safety of own home.
   4. Assessment of fire safety of our institute.
   5. Assessment of electrical safety of various electrical equipments.
   6. Drill of rescue of victim of electrical hazard.
   7. Demonstration of CPR training (a trained Compounder/nurse or doctor should impart training)
   8. Self employment formation, Feasibility, Legal formalities i.e., Shop act, Estimation & costing, Investment procedure - Loan procurement - Banking processes.
   9. Role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies / programmes, procedure & the available scheme.