Solapur University, Solapur

UGC Sponsored

Career Oriented Programme (COP)

Repair and Maintenance of Electronic Appliances

Shankarrao Mohite Mahavidyalaya, Akluj

Tal. Malshiras Dist Solapur- 413 101.

1. Introduction:

The University Grants Commission (UGC) New Delhi, sponsored Career Oriented Programme, **Repair and Maintenance of Electronic Appliances,** is started in the Shankarrao Mohite Mahavidyalaya, Akluj form academic year 2007-08. This is an add-on course. It is envisaged that professionally qualified graduates with a sound knowledge of their core disciplines and expertise in a concerned skill will have more openings in for employments in various sectors and self-employment. Demand and scope for such professionally trained graduates are visible in the various sectors. To meet this challenge, UGC would like to introduce skill oriented & value added, add-on course in the college to be opted by students as a parallel sub-discipline while pursuing their degree level education.

As per the UGC Guidelines, the programme will be run at three progressive levels **Certificate level, Diploma level and Advanced Diploma level,** parallel to the conventional B.Sc. degrees.

2. Objectives

The main objective of this scheme is to introduce career and market-oriented, skill enhancing add-on course that have utility for job, self-employment and empowerment of the students. At the end of three years, the students will be equipped with a Certificate/Diploma/Advanced Diploma as an add-on course.

3. Levels : The programme runs in following **three levels,** progressively.

a) Certificate Course
b) Diploma Course
c) Advanced Diploma Course

4. Eligibility : The students of our college having admission at B. Sc.-I are eligible for Certificate level course. Further, progressively, they can opt for diploma and advanced diploma course at B. Sc.-II and B.Sc-III.

5. Intake Capacity **:** 30

6. Coordinating Department **:** Department of Electronics.

7. Salient Features **:**

- **The course is sponsored by University Grants Commission, New Delhi.**
- **The University will issue Certificate to the successful candidate.**
- **Separate and well equipped laboratory.**
- **Qualified and experienced staff.**
- **Facility of On-job training.**
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8. Course Structure :

In addition to the theoretical knowledge, emphasis is given to the laboratory training, Project work, Field work and On-Job Training. The Course includes Theory papers and Laboratory Training. The structure is as under.

- T**heory Paper** **: 100 Mark**s
  (Two Sections each of 50 Marks)
- **Practical course** **: 100 Marks**

Distribution of Practical Course

- **Practical : 60 Marks**

Expt . No. 1	: 25 Marks
Expt. No. 2	: 25 Marks
Laboratory journal	: 10 Marks

- **Project work/On-Job Training : 40 Marks**

Project work / On-Job Training	: 25 Marks
Project / Training report	: 10 Marks
Industrial Visit	: 5 Marks

9) Syllabus :

I) Certificate Course

Paper – I Fundamentals of Electronics and Introduction to Test and Measuring Equipments

Section –I : Fundamentals of Electronics

1) **Passive Circuit Elements : 25**
   a) **Resistor :** Identification, types of resistors, Carbon Composition, Wire Wound, Thin Film, SMD Resistors, colour codes of the carbon Composition resistors. Trimpot (Specifications, power ratings, and applications only)
   b) **Capacitor :** Identification, types, Fixed Capacitors & Variable Capacitors, Electrolyte, Mica, Ceramics, SMD, Gang Condenser, Trimmer, (Specifications and applications only) Coding of the Capacitor
   c) **Inductor :** Identification, types, Iron Core, Ferrite Core, Air Core (Specifications and applications only)
   d) **Transformer :** Principle of operation, types, Step up & Step Down (Specifications and applications only) Primary and secondary current and voltage rating.
   e) Fuses, relays, switches , cables, connectors: Types, Specifications & Applications of MCB
2) **Active Devices : 15**
   a) **Diode:** Forward & reverse biasing, I-V Characteristics, Cut-in- voltage. Diode as rectifier, Bridge Rectifier, Advantages and Disadvantage of Bridge Rectifiers. Type of diode Germanium, Silicon, IR, Schottkey, Zener diode. (Specifications & Applications only)
   b) **Transistor :** BJT, npn & pnp types, I-V Characteristics of npn transistor, Transistor as Amplifier, Application of transistor as a switch. Use of transistor to drive LED and Relay. Signal Transistor, Power Transistor, Heat Sink
3) **Power supply : 5**
   Block Diagram of Simple Power Supply, Voltage Regulation, Line Regulation and Load Regulation, Three terminal Voltage regulators 78XX and 79XX series, introduction to variable Power supply. Troubleshooting of Stabilizer
4) **Circuit Fundamentals : 5**
   Basic concept of electric potential, AC and DC Voltages and Currents, Peak value and RMS values, Concept of Earthing and Grouding. Safety precautions.

Reference Books:

1) Electronic Components and Materials – S. M. Dhir, TMH, New Delhi.
2) Basic Electronics: Solid State – B. L. Theraja S. Chand & Co. New Delhi 5th Ed. (2004)
3) Fundamentals of Electronic Engineering - B. L. Theraja S. Chand & Co. New Delhi Revised Ed. (2001)

4) Text Book of Applied Electronics- R. S. Sedha, S. Chand & Co. New Delhi 2nd Ed. (2005)

Section II : Introduction to Test and Measuring Equipments

1) **Fundamentals of Test and Measuring Instruments :** **10**

Operation of Analog and Digital Multimeters, Measurement of AC and DC voltages and currents using analog and digital multimeters. Resistance Measurements. Megers, Insulation tester.

2) **LCR Meter :** **10**

Fundamentals of LCR meter, Measurement of Inductance, Capacitance and Resistance.

3) **Oscilloscopes :** **10**

Fundamentals of CRO, Block diagram of CRO, Measurement of voltage, frequency and phase angle. Study of various functions available on general Dual trace CRO. Study of front panel control of CRO.

4) **Frequency Generator :** **5**

Function generator, need of function generator for repairing and maintenance of Electronic Appliances. Study of front panel control of Function Generator. .

5) **A case study of** **15**

a) **ON/OFF Stabilizer**
b) **Microwave oven**

Block diagram, Electronic control, various Maintenance and Troubleshooting

.**Reference Books:**

1) Consumer Electronics – S. P. Bali, Pearson Education, New Delhi.
2) Electronics Devices and Circuits- B. L. Theraja and A. K. Theraja, S. Chand & Co. New Delhi, Ist Edition (1999).
3) Instrumentation Devices and systems – C. S. Rangan, G. R. Sharma and V. S. Mani TMH 2nd Ed.
4) Electronic Measurements – U. A. Bakshi & V. U. Bakshi, Technical Publications, Pune.

Practicals :

1) Study of Passive Components
2) Study of Transformers
3) Tracing of the circuit
4) Measurement of Electrical Parameters using Analog Multimeters
5) Measurement of Electrical Parameters using Digital Multimeters
6) Measurement Inductance & Capacitance using LCR meter
7) Measurement of Voltage and Frequency by using CRO
8) Verification of Kirchhoff`s Laws
9) Verification of Ohms Law
10) Study of Function Generator
11) Transistor as Amplifier
12) Relay drive by the Transistor
13) Assemble and Testing Power supply
14) Fault finding of Power supply
15) Study of Three Terminal Voltage Regulators.
16) Identification and Fault Finding of the Mixer.
17) Assemble and Testing ON/OFF Stabilizer
18) Fault finding of ON
19) /OFF Stabilizer

II) Diploma Course

Maintenance of Computer Hardware and Networking

Section – I

Unit – I Fundamental of Computer Hardware

Fundamentals of computer Hardware. Speed, Memory capacity etc. The Motherboard. Memory Unit, Buses, Input and output devices, Disk Drives, I/O Ports, Parallel Ports, Com Port and USB ports. Power supply, Speakers and Cooling Fans etc devices.

Unit – II Operating Systems :

- Need of operation systems.
- Introduction to Windows Xp and its features
- Operating system and Application Programmes
- Windows Xp : Desktop and Menus, Taskbar, My documents, My picture, Recycle bin etc.
- Files and Folders: Managing of the files and folders, Creation, Deletion, Navigation, Copying of the files and folders.
- Windows Accessories : Calculators, Note Pad, Paints, word pad Command prompt, Defragmentation Scandisk etc.

Unit – III Computer Assembling and Trouble Shooting :

- Variants of Motherboards, Variants of CPU, Types of Hard disk, Types of memories.
- Assembling Hardware component of the computer.
- Installation of Windows Xp Operating System.

Unit – IV Installation of Hardware

Installation of Scanners, Printers, Cameras etc. devices

Section – II

Unit – -I Network Fundamentals

- Introduction of computer network
- Types of Network: LAN, WAN, PSTN, ISDN. Structure, merit & demerits only
- Internetworking, Comparison between LAN and WAN.

Unit – II Network Topology and Network Control devices

(a) Network topology :

- Introduction of Network Topology
- Classification of network topology, comparison between BUS, Star, Mesh, Ring, Tree Topologies.

(b) Network Control devices :

Introduction to Hubs, Repeaters, Routers, Switches etc devices

Unit – III TCP/IP Protocols

- Introduction to OSI Reference Model.
- Introduction to TCP/IP reference Model.
- Overview of TCP/IP Architecture, Advantages and Disadvantages of TCP/IP.

Unit – IV Installation and trouble shooting of LAN

- Network cables and connectors
- Crimping Techniques and Installation of LAN, Addressing, Sharing etc.
- Troubleshooting of LAN.

Reference Books:

1) Fundamentals of Computers – V. Rajaraman Third Edition, PHI Publication NewDelhi.(2001)
2) Data Communication and Networking- J . S. Katre, Tech-Max Publication (2005)
3) Reference Guide to Microsoft Windows Xp, Kirtschewartz BPB Publi.
4) Multimedia Systems – S. K. Bansol APH New Delhi.
5) Networking : A beginners guide – Bruce Hallberg TMH 2005
6) Computer Organization – Carl Hamachar Vth Edition, TMH.

Practicals :

1) Study of Mother Boards of PC
2) Study of Computer Power supply unit.
3) Installation of Hard Disc.
4) Installation of Drives and Ports
5) Assembling the computer
6) Installation of Operation system (Windows Xp)
7) Study of Windows Xp : Desktop and other menus
8) Study of Windows Xp : Files and Folder Management.
9) Installation of Printers.
10) Installation of Microsoft office.
11) Installation of LAN Card to PC
12) Study of Switches and Routers
13) Crimping and Cabling
14) Addressing the Network
15) Sharing of the Printers Folder and Drives.
16) Installation of Internet on Computer.
17) Trouble shooting of the LAN

III) Advance Diploma Course

COMPUTER HARDWARE AND NETWORKING-II
and
PROGRAMMING IN Language C

Section – I : COMPUTER HARDWARE AND NETWORKING-II

1. **Microprocessor and their Generations:**
   First-Second-Third-Fourth-Fifth-Pentium-AMD K5-Cyrix-Sixth eneration-Pentium Pro-PII-Celeron-PIII-P4-AMD K6(K6-2,K6-3)-AMD Athlon K7-Athlon K75-AMD Core 2 Duo processor, comparison. Advanced Chipsets: Chipsets-Pentium II 845GL-845GL Chipsets.

2. **System Buses**
   Introduction 8 bit ISA Bus-16 bit ISA Bus-MCA Bus-EISA Bus-Local Bus-VESA Local Bus-PCI Bus-Expansion Buses-Troubleshooting

3. **Memory :**
   Introduction Organization Primary Secondary DRAM SRAM-Modules SIMM SIPP DIMM Asynchronous DRAM Synchronous DRAM Memory Requirement Memory Upgrade Trouble shooting

4. **Basics of Internet :**
   Getting connected Addresses and Names Web objects E-mail setting up E-mail creating creating E-mail message e-mail Message editing attaching Files Sending and Receiving Mail www File transfer Telnet Usenet Gopher

5. **Point to Point Protocols**
   What is remote access? RAS, Transmission states, Point to Point layers, Link control protocol, Authentication, Network control protocol.

6. **Overview of MS Windows Server 2003 System Administration**
   Microsoft windows server 2003, Domain controllers and members servers, Understanding and using server roles, frequently used tools, Using control panel utilities, Using graphical administrative tools, Using command line utilities.

Reference Books:

1) Fundamentals of Computers – V. Rajaraman Third Edition, PHI Publication NewDelhi.(2001)
2) Data Communication and Networking- J . S. Katre, Tech-Max Publication (2005)
3) Networking All in One Desk reference – Doug Lowe 2nd Ed. Wiley India Pvt. Ltd. 2007.
4) Networking : A beginners guide – Bruce Hallberg TMH 2005
5) Computer Organization – Carl Hamachar Vth Edition, TMH.

Section –II : PROGRAMMING IN Language C

1. Fundamentals of C Programming

Structure of a C Program, Execution of a C Program. Character set, Identifiers and Keywords, Data Types, Data Ranges, Constants, Variables, Declaration of Variables, Expressions, Statements, Overflow and underflow, Reading data from keyboard, Symbolic constants

2. Operators and Expressions

Arithmetic operators, Integer arithmetic, Real arithmetic, Mixed mode arithmetic, Relational Operators, logical Operator, Assignment Operators, Increment and Decrement Operators, Conditional Operator. Arithmetic Expressions and their evaluation

3. Input and Output Operations

Reading a character, Writing a character, Formatted input and Output

4. Control Statements

If statement, switch statement, while statement, do-while statement, for statement.

5. Arrays and Pointers

One dimensional array, Two dimensional array. Definition and use of the one dimensional array. Introduction to the pointers

6. Character Strings

Reading and Writing Strings, Arithmetic operators on Characters, Putting Strings together, Comparison of Two Strings, Functions for String handling: strcat, strcmp, strcpy etc.

7. User Defined Functions

Advantages of User defined functions, Defining a function, Category of functions, Function Prototypes, Function with arrays, Nested functions, variables in Functions.

Reference Books:

1) Let us C – Yaswant Kanetkar, BPB Publications, New Delhi.
2) Programming in ANSI C – E. Balgurusamy, TMH New Delhi.

Practical :

1) Study of 845GL Chipset.
2) Installation of RAM.
3) Study of ISA and PCI buses
4) Internet-I
5) Internet-II
6) Study of internet explorer
7) Installation of proxy server
8) Introduction windows 2003 server.
9) Study of wireless networking
10) Programming in C: Arithmetic operations
11) Programming in C: Logical operations

12) Programming in C: Study of preprocessors
13) Programming in C: Study of flow Control commands
14) Programming in C: Study of Loops
15) Programming in C: Study of Arrays
16) Programming in C: Study of Pointers
17) Programming in C: Study of User`s Defined function
18) Programming in C: Study of String manipulation

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