

Department of Electronics

Course Name: Vocational Skill Enhancement Course
Paper Name: Basics of Information Technology and Programming
Course Code: UEL232P

Credits: 2 (4 Pr)

No. of Practical Hrs.: 60

Course description:

This course covers the fundamentals of computer technology, including an overview of computer hardware, software, and networks. Students will learn the basics of algorithms and flowcharts, as well as the principles of programming. The course will also provide a comprehensive understanding of object-oriented programming concepts, including their development and working process in software. By the end of the course, students will have a solid foundation in computer science and will be able to apply their knowledge to develop software solutions using programming techniques.

Course Objectives:

The learning objectives of this course are:

1. Demonstrate an understanding of various number systems, computer language generations, and translators.
2. Identify and describe different types of computer memories, storage devices, input and output devices.
3. Develop basic programs using programming concepts and create algorithm and flowcharts for programs.
4. Utilize control and looping structures in programming and demonstrate an understanding of arrays and functions in programs.

Course Learning Outcomes:

Upon completion of this course, learners will be able to:

1. Demonstrate an understanding of different number systems, generations of computer languages, and translators.
2. Identify and describe various types of computer memories, storage devices, input and output devices, and their functions in computer systems.
3. Develop basic programs using programming concepts and create algorithm and flowcharts for programs.
4. Utilize control and looping structures in programming and demonstrate an understanding of arrays and functions in basic programs. Learners will be able to implement these concepts to create software applications for various purposes.

Unit I: Evolution and Computer Basics

Evolution of Computers, Generations of Computer, Characteristics of a Computer, Computer Classification. Basic Components of Digital Computers, Block Diagram. CPU: Functions of each Unit, Primary Memory, ALU and CU, Instruction format. Bus: Data, Control and Address Bus. Language, Generation of Languages: Machine, Assembly, High Level Languages. Characteristics of Good Language Translators: Compiler, Interpreter and Assembler. Source and object Program.

Unit II: Memory and Basics of Programming

Memory hierarchy, RAM, Static & dynamic RAM, Types of RAM and ROM, Flash and Cache. Storage Devices: Hard Disk, Zip Disk and Optical Disk. Pen Drive, Blu Ray and SSD. Input Devices: Keyboard, Mouse, Light Pen, Touch Screen, Voice Input, MICR, OCR, OMR, Barcode Reader and Flatbed Scanner. Output Devices: VDU, Printers: Dot Matrix, Laser and Inkjet. Plotters.

Machine language, Assembly language, High level languages. Problem Solving techniques: Development Tools: Algorithm, Flowcharts (Definition and its characteristics) Developing Algorithm and Drawing flowcharts.

Unit III: Concepts of Programming Languages

C character set, Tokens, Identifiers, Keywords, Variables, Data types, Qualifiers. Operators and Expressions: Arithmetic, Relational, Logical, Bitwise, Increment, Decrement, Conditional and Special operators, Constants, Declaring Symbolic Constants, Character Strings, Operator Precedence and Control Structure: Compound statement, Selection statement: if, if-else, nested if, switch. Iteration statement: for, while, do while, Nested loops, Jump statement: break, continue, goto. Arrays: Need, Types: Single - and Two-dimensional Array.

List of Practical

1. Write an algorithm, draw flowchart, and execute a program to find the greatest of three numbers.
2. Write an algorithm, draw flowchart, and execute a program to swap values of two numbers without using third variable.
3. Write an algorithm, draw flowchart, and execute a program to calculate the factorial of given number.
4. Write an algorithm, draw flowchart, and execute a program to check given number is prime or not.
5. Write an algorithm, draw flowchart, and execute a program to print Fibonacci series up to 10 terms.
6. Write an algorithm, draw flowchart, and execute a program to check entered number is palindrome or not.
7. Write an algorithm, draw flowchart, and execute a program to check enter character is vowel or not.
8. Write an algorithm, draw flowchart, and execute a program to find the sum of digit of entered number using function.
9. Write an algorithm, draw flowchart, and execute a program to find the reverse of entered number using function.
10. Write an algorithm, draw flowchart, and execute a program to print maximum and minimum number in each array.
11. Write an algorithm, draw flowchart, and execute a program to print sum of numbers of an array.
12. Write an algorithm, draw flowchart, and execute a program to print reverse numbers of an array.

Reference Books

1. The Art of programming through flowcharts & algorithm by Anil B. Chaudhari, Firewall Media, Laxmi Publication, New Publication.
2. Programming in C by E. Balagurusamy.
3. C Programming – Kernighan & Ritchie
4. C Programming – Dr. Vishal M. Lichade Wiley-Dreamtech Publication
5. Let us C – Y. Kanetkar.
6. C Programming – Holzner, PHI Publication.
7. Programming in C – Ravichandran.
8. Information Technology Concepts by Dr. Madhulika Jain, Shashank & Satish Jain, [BPB Publication, New Delhi.]
9. Fundamentals of Information Technology By Alexis And Mathews Leon [Leon Press, Chennai & Vikas Publishing House Pvt. Ltd, New Delhi]

Department of Electronics
Course Name: Skill Enhancement Course
Paper Name: Office Automation
Course Code: UEL233P

Credits: 2 (4 Pr)

No. of Practical: 30

Course Description:

This course would enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.

Learning Objectives:

- To familiarize the students in preparation of documents and presentations with office automation tools.

Course Learning Outcomes: After completion of this course the students would be able:

- To work in office, handle documents, spreadsheets, make presentations and communicate through internet.

UNIT – I

Introduction, basics, starting Word, creating document, parts of Word window, mouse and keyboard operations, designing a document; Formatting- selection, cut, copy, paste; Toolbars, operating on text; Printing, saving, opening, closing of document; Creating a template; Tables, borders, pictures, text box operations; Mail Merge.

UNIT – II

Introduction to MS EXCEL, navigating, Excel toolbars and operations, Formatting; copying data between worksheets; entering formula, chart creation; data forms, data sort; Functions in Excel ROUND(), SQRT (), MAX(), MIN(), AVERAGE(), COUNT(), SUMIF(), SUMIF(), ABS(), ROMAN(), UPPER(), LOWER(), CELL(), TODAY(),NOW().Charts in Excel, Sorting, Searching, and Filtering data.

UNIT – III

Introduction to MS POWER POINT Working with Power Point Window, Standard Tool Bar, Formatting tool bar, Drawing tool Bar, Moving the Frame, Inserting Clip Art, Picture, Slide, Text Styling, Send to back, Entering data to graph, Organization Chart, Table, Design template, Master Slide, Animation Setting, Saving and Presentation , auto Content Wizard.

List of Practical

1. To Prepare a Resume/Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
2. To create a table using table menu, using cell editing operations like inserting, joining, deleting, splitting and merging cells.
3. To create numbered list and bulleted list with different formats (with numbers,

- alphabets, roman letters).
4. To use mail merge facility for sending a circular letter to many persons.
 5. To Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student).
 6. To perform operations like finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.
 7. To create a chart for comparing the monthly sales of a company in different branch offices.
 8. To perform Sorting, Searching operations, and Filtering Data.
 9. To create a new Presentation based on a template – using Auto content wizard, design template and Plain blank presentation.
 10. Creating a Presentation with Slide Transition – Automatic and Manual with different effects.
 11. Creating a Presentation applying Custom Animation effects – Applying multiple effects to the same object and changing to a different effect and removing effects.
 12. Creating and Printing handouts.

Reference Books

1. MS Office XP for Everyone By Sanjay Saxena (Vikas Publi, Noida)
2. MS-Office 2000(for Windows) By Steve Sagman
3. A First Course in Computers – Sanjay Saxena

Department of Electronics

Course Name: Skill Enhancement Course

Paper Name: Fundamentals of Soldering and PCB Designing

Course Code: UEL243P

Credits: 2 (4Pr)

No. of Practical Hrs: 60

Course Description:

Electronic circuits have become the essential part of everyone's life these days. Soldering and PCB design are the most important integral part of every electronic circuit. Therefore, such skill needs to be developed among the students which may lead to self-employment or even creates opportunities for others too. This course will be helpful to develop these skills among the students.

Learning Objectives:

1. To understand the fundamentals of soldering and its tools
2. To learn to perform soldering of electronic components
3. To develop skills of PCB design

Course Learning Outcomes:

On completion of this course, learner will be able to

1. Select proper tools for soldering
2. Perform soldering of various electronic components
3. Rectify the errors in soldering
4. Use KiCad Editor (Free Open-Source Software for PCB Design)
5. Design simple PCBs as per the schematic design

Unit-I: Soldering Fundamentals

What Is Soldering? Other Types of Soldering, The Difference Between Soldering and Welding, Soldering Electronics

Basic Soldering Tools and Material: What Soldering Iron Should You Purchase? Soldering Iron Accessories Getting a Grip on Your Work, Summary of Tools, Materials, Preparing Your Soldering Iron and Workstation, Soldering Printed Circuit Boards (PCBs), Trimming the Wire Leads after a Successful Soldering Connection, Connecting Wires or Components Without a PCB.

Unit-II: Troubleshooting and Fixing Mistakes

Common Mistakes, Different Ways to Remove Solder, Repairing Lifted Pads.

Advanced Soldering: Tools, Materials, How to Solder Simple Surface-Mount Devices, How to Solder a Multi-lead SMD, When Something Goes Wrong—Fixing and Removing Components.

Unit-III: Fundamentals of PCB Design

Fundamental of basic electronics, Component identification, Component symbols & their footprints, Understand schematic.

Introduction to the KiCad PCB Editor, PCB Editor user interface, Navigating the editing canvas, Hotkeys, Display and selection controls, Creating a PCB, Basic PCB concepts, Board setup Editing a board, Placement and drawing operations, Snapping, Working with footprints, Working with pads, Working with zones, Graphical objects Dimensions, Routing tracks Forward and back annotation Importing graphics Inspecting a board, Generating outputs, Additional fabrication outputs Printing Exporting files Footprints and footprint libraries. PCB processing

List of Practical

1. Soldering Practice Board
2. Soldering Iron Temperature Control
3. Soldering Iron Tip Maintenance
4. Soldering Iron Tip Replacement
5. Through-Hole Soldering Practice
6. Surface Mount Soldering Practice
7. PCB Design Practice

References

1. Make: Getting Started with soldering by Marc de Vinck
2. <https://www.kicad.org/>