

Company Profile and Training Objectives

Warm Greetings from **REDO Skill Maturing Workshop!!!**

Founded In 2020, **REDO Skill Maturing Workshop**, The Name Itself Has Its Solution Which Was Started To Recycle Your Skills Which You Left As It Was Some Days Ago. You Cannot Get Your Wasted Time Back, But You Can Get Another Chance To REDO Your Process Of Implementing Your Dream Work From Now And With Us To Grow Logically Even More Than Better and Stronger. We Never Try To Educate Our Candidate's Mind By Commanding, Grading Or By Triggering Their Mind By Promising For Fake Placements. Rather We Create Passion On The Work, We Make Them Understand "Why They Came To Us, What They Learn From and How To Make Money Out Of It" If They Spend Their Valuable Time With Us.

Join with us!!! Have a great experience!!!

"**REDO Skill Maturing Workshop**" is a brand of quality. We are one among the best training institutes in India. We have honest and experienced training unit for Programming Languages / Sensor Development / IOT / Embedded Systems / VLSI / Robotics / Automation / Mechatronics / Image Capturing and Security / Data Science / Machine Learning / Web Design and Development And Many More... We always include Notes Making and Logical Thinking With Latest Industry Standard Contents to Serve Our Candidates For Reaching Their Goals, Safely And Consistently. To be Honest, Rather keeping financial target we always prefer candidate's satisfaction as our prime target.

Why **REDO Skill Maturing Workshop**?

REDO Skill Maturing Workshop is the sister concern of Embuzz Technologies Private Limited. The quality of training is too good. We have only qualified, experienced and logically sound candidates for respective training division. We always have updated syllabus so that bench candidates will be more confident to perform in the respective technology as well as other respective skills, rather blindly searching for jobs. Our Certification is truly valid because we won't certify the candidates unless we get satisfied with their performance. We just see the certification as a paper. Because **if**



candidate performs well rather simply trying to showcase as he/she is a certified person without developing his/her skills, the concern will automatically get reputation. We will never brainwash our clients with the word "100% Placement Assistance" Rather saying them about the power of being a performer.

Training is our Profession!!! And Training is Our Passion Too!!! and That's the brand value of "REDO Skill Maturing Workshop".

Secret Of Success:

- ✓ We **never try to educate** anyone **instead we make them to experience** the technology.
- ✓ We **grow our candidates** with recent technologies **by providing strong guidance** as **"How to be a performer?"** and **erasing the mindset of "How to get placed?"**

We feel proud to say that we **produced more than 10,000+ Certified Professionals** till date in the fields such as Embedded Sys, Automation, Mechatronics design, Web solutions, Technical Tutor, Entrepreneur, etc...

Objectives of the training:

These courses are to help fresh graduates or working engineers to enhance their Practical knowledge and technical skills in various aspects of Embedded System Design like designing in 8-bit, 16-bit and 32-bit Microcontrollers as well as VLSI Processers. Emphasis is given to design each task and providing skill development to solve the logic for the concept through practical sessions rather solving the problems blindly. This enables to maximize the participants engineering and design skills and thereby becoming successful Embedded System and VLSI Designers.

The focus of this course is to design and implementation of Embedded Systems and VLSI FPGA Using a practical mixture of Formal Technical Sessions and "Hands On" Sessions for you to improve your professional skills.





This course has been designed to introduce you to the key skills needed to design and implement reliable embedded systems in a range of different industry sectors and as per their requirements. Courses are now being introduced in order to meet current requirement of Core Electronics, Automation, Robotics and Information Technology field specifically in the area of Embedded Technology with VLSI too.



Certification Course In PIC Microcontrollers

Microcontrollers with built-in peripheral functions (such as PWMs for Motor Control, Serial ports, ADCs, Digital I/Os, EPROM, RAM etc.), and lower power consumption are popular and very economical less sensitive system of Digital System Design.

For medium and complex applications, Basic 8-bit Microcontrollers are not suitable whereas Programmable logic Controllers are the optimum ones. For these reasons the study of PIC Microcontrollers and their applications in system design has assumed an important place in engineering and applied sciences. Keeping this in mind, this module is structured to give an exposure to different aspects of PIC Microcontroller based System Design.

Course Schedule

Sl.No	Course Name	Theory Hrs	Practical hrs	Total Hrs
1	PIC Micro Controllers	10	44	54

The Chapter wise Class hour Schedule is given below

Chapter 1: Basics of Microcontroller

Microcontroller, Different types, Various Processor architectures, Micro controller memory types and its features, difference between micro controller and microprocessor. Number system

Chapter 2: PIC Architecture

Basics of RISC architecture -8 bit and 16 bit processors, Memory types and sizes- Code Memory-On chip memory, External code memory, RAM-on chip RAM, External RAM. EEPROM
PIC micro controller overview, Harvard architecture and pipeline, Pin description CPU registers, Register file structure The working register, File registers, Band selection, Special function registers, PORTA and PORTB, TRISA and TRISB.

Chapter 3: Embedded C programming (PIC C complier)

C programming- Embedded C Basics, PIC Compiler handling, Creating and modifying projects in PIC Compiler Conventional programs, Embedded programs, High and low-level, Low-level PIC micro, getting your programs into a compiler, Writing your programs
Projects- LED Interface, Switch Interface, Seven Segment Display, DC Motor Interface.

Chapter 4: PIC Peripherals

Timers - Basics of Timer Handling, 8 bit / 16 bit timers, Watchdog, PWM, Timer count value calculation.

Serial port - Basics of serial port (RS232), Types of connectors, Interfacing PC with micro controller, MAX 232 interface Hardware structure, Serial port configuration (mode selection), Baud rate calculation.



5) Chapter 5: PIC Peripherals

Interrupt - Basics of interrupt, Polling method, difference between polling and interrupt method, types of interrupt in PIC, Interrupt service routine (ISR), Interrupt configuration, Interrupt priority, Level and Edge type interrupts.

ADC - Theory of ADC, types, inbuilt ADC, interfacing external device to ADC

DAC - Interfacing external device to DAC

ANALOG COMPARATOR

Protocol - I2C, SPI Reading and Writing to and from **EEPROM** Memory

Chapter 6: LAB Projects

Project 1: Interfacing LED with controller

Project 2: Interfacing Switches with controller

Project 3: Interfacing 7 segment with controller

Project 4: Interfacing Keypad with controller

Project 5: Interfacing LCD with controller

Project 6: Interfacing DC Motor with controller

Project 7: Interfacing Stepper Motor with controller.

Project 8: Using PIC Timers (8/16 bit).

Project 9: Using Serial port of PIC, Data Communication between PIC micro controller and PC.

Project 10: Using PIC Interrupts, above projects are in interrupt method.

Project 11: Using inbuilt ADC of PIC, measuring light intensity and using controlling for Home appliances.

Project 12: Measuring room temperature using Sensor (LM 35) for Fire Alarm system.

Device Platform:

PIC Evaluation Board, MPLab/CCS compiler, Downloader.

Programming Language: MPLab/CCS compiler

On completion Participants will learn:

- PIC Microcontroller architecture, programming and hardware interfacing
- Various types of PIC Microcontrollers and their potential applications.
- How to design systems/products based on PIC Microcontrollers with main focus on Industrial applications.



Advanced Certification Course In AVR MCU

Advanced Microcontrollers with built-in peripheral functions (such as PWMs for Motor Control or UPS, Frequency measurement, Serial ports, ADCs, Digital I/Os, EPROM, RAM etc.), and lower power consumption are very popular and have drastically altered the economics of Digital System Design.

For medium and complex applications, basic 8-bit Microcontrollers are not suitable whereas Advanced Virtual RISC Controllers are the optimum ones. For these reasons the study of AVR Microcontrollers and their applications in system design has assumed an important place in engineering and applied sciences. Keeping this in mind, this module is structured to give an exposure to different aspects of AVR Microcontroller based System Design.

Course Schedule

Sl.No	Course Name	Theory hrs	Practical hrs	Total Hrs
1	AVR Micro Controllers	10	44	54

The Chapter wise Class hour Schedule is given below

Chapter 1: Basics of Microcontroller

Microcontroller, Different types, Various Processor architectures, Micro controller memory types and its features, difference between micro controller and microprocessor. Number system

Chapter 2: AVR Architecture

Basics of RISC architecture -8 bit and 16 bit processors, Memory types and sizes- Code Memory- On chip memory, External code memory, RAM-on chip RAM, External RAM. EEPROM AVR micro controller overview, Harvard architecture and pipeline, Pin description CPU registers, Register file structure The working register, File registers, Band selection, Special function registers, PORTA and PORTB, PORTC and PORTD.

Chapter 3: Assembly Language Programming (Overview)

Assembly Language Programming - Opcode and operand, Addressing Modes- Immediate, Direct, Indirect, External Direct, External Indirect. AVR Instruction Sets - Bit and Byte oriented instructions, Constants and Literals, Format for Instructions. AVRSTUDIO- Handling the projects in AVRSTUDIO, Creating and modifying in AVRSTUDIO. Projects- LED Interface, Switch Interface, Seven Segment Display, DE Motor Interface.

Chapter 4: Embedded C programming (WINAVR C complier)

C programming- Embedded C Basics, WINAVR Compiler handling, Creating and modifying projects in WINAVR Compiler Conventional programs, Embedded programs, High and low level, Low level AVR MICRO, Getting your programs into a compiler, Writing your programs



5) Chapter 5: AVR Peripherals

Timers - Basics of Timer Handling, 8 bit and 16 bit timers, Watchdog, PWM, Timer count value calculation.

Serial port - Basics of serial port (**RS232**), Types of connectors, Interfacing Pc with micro controller, MAX 232 interface Hardware structure, Serial port configuration (mode selection), Baud rate calculation.

Interrupt - Basics of interrupt, Polling method, difference between polling and interrupt method, types of interrupt in AVR, Interrupt service routine (ISR), Interrupt configuration, Interrupt priority, Level and Edge type interrupts.

ADC - Theory of ADC, types, inbuilt ADC, interfacing external device to ADC

DAC - Interfacing external device to DAC

ANALOG COMPARATOR

Protocol - I2C, SPI Reading and Writing to and from **EEPROM** Memory

6) Chapter 6: LAB Projects

Project 1: Interfacing LED with controller

Project 2: Interfacing Switches with controller

Project 3: Interfacing 7 segment with controller

Project 4: Interfacing Keypad with controller

Project 5: Interfacing LCD with controller

Project 6: Interfacing DC Motor with controller

Project 7: Interfacing Stepper Motor with controller.

Project 8: Using AVR Timers (8/16 bit).

Project 9: Using Serial port of AVR, Data Communication between AVR micro controller and PC.

Project 10: Using AVR Interrupts, above projects are in interrupt method.

Project 11: Using inbuilt ADC of AVR, measuring light intensity and using controlling for Home appliances.

Project 12: Measuring room temperature using Sensor (LM 35) for Fire Alarm system.

Device Platform:

AVR Evaluation Board, AVRSTUDIO Assembler, WIANAVR C compiler, Sina Prog Downloader.

Programming Language: Assembly Language Programming, AVR Studio 4.0, WINAVR C Programming

On completion Participants will learn:

- Advanced Virtual Microcontroller architecture, programming and hardware interfacing.
- Various types of AVR Microcontrollers and their potential applications.
- How to design systems/products based on AVR Microcontrollers with main focus on Industrial applications.



Advanced Certification Course In ARM

ARM Processors with built-in peripheral functions (such as PWMs, Frequency measurement, Serial ports, ADCs, Digital I/Os, EPROM, RAM etc.), and lower power consumption are very popular and have drastically altered the economics of Digital System Design.

For medium and complex applications, 8-bit and 16 bit Microcontrollers are not suitable whereas 32-bit Microcontrollers are the optimum ones. For these reasons the study of 32-bit Microcontrollers and their applications in system design has assumed an important place in engineering and applied sciences. Keeping this in mind, this module is structured to give an exposure to different aspects of 32-bit Microcontroller based System Design.

Course Schedule

Sl.No	Course Name	Theory hrs	Practical Hrs	Total Hrs
1	ARM Processors	20	55	75

The Chapter wise Class hour Schedule is given below

Chapter 1: Basics of Microcontroller

Microcontroller, Different types, Various Processor architectures, Micro controller memory types and its features, difference between micro controller and microprocessor. Number system, 32 bit operation

Chapter 2: ARM Architecture

Basics of ARM architecture - RISC vs. CISC, RISC vs. ARM. 32 bit architecture
Memory types and sizes - Code Memory - On chip Flash memory, External code memory, RAM - On chip RAM memory, External RAM. EEPROM memory.

ARM micro controller overview, The **ARM7TDMI** processor, 32 bit CPU registers, CPSR and SPSR register, and ARM pipeline

Chapter 3: Embedded C programming

C programming- Embedded C Basics, Compiler handling, Creating and modifying projects in Compiler Conventional programs, embedded programs, getting your programs into a compiler, writing your programs

Chapter 4: ARM7 Peripherals

Timers - Basics of Timer Handling, timer counter, Watch dog timer, PWM generator, Timer count value calculation.



Serial port - Basics of serial port (**RS232**), Types of connectors, Interfacing Pc with micro controller, MAX 232 interface Hardware structure, Serial port configuration (mode selection), and Baud rate calculation.

Interrupt - Basics of interrupt, Polling method, difference between polling and interrupt method, types of interrupt in ARM, Interrupt service routine (ISR), Interrupt configuration, Interrupt priority, Level and Edge type interrupts.

ADC - Theory of ADC, types, inbuilt ADC, interfacing external device to ADC

ANALOG COMPARATOR

Protocol- I2C, SPI

Chapter 5: Projects

Project 1: Interfacing LED with controller

Project 2: Interfacing Switches with controller

Project 3: Interfacing 7 segment with controller

Project 4: Interfacing Keypad with controller

Project 5: Interfacing LCD with controller

Project 6: Interfacing DC Motor with controller

Project 7: Interfacing Stepper Motor with controller.

Project 8: Using Timer.

Project 9: Using Serial port of ARM, Data Communication between ARM micro controller and PC.

Project 10: Using Interrupts, above projects are in interrupt method.

Project 11: Using inbuilt ADC of ARM, measuring light intensity and using controlling For Home appliances.

Project 12: Measuring room temperature using Sensor (LM 35) for Fire Alarm system.

Project 13: Real Time clock with time and date display.

Device Platform:

ARM7 Evaluation Board, Keil Compiler, Flash Magic

Programming Language: Embedded C Compiler

On completion Participants will learn:

- ARM7 Processor architecture, programming and hardware interfacing
- Various types of ARM Processors and their potential applications.
- How to design systems/products based on ARM Processors with main focus on Industrial applications.



Advanced Certification Course In ROBOTICS

The field of robotics has become an exciting and accessible tool for teaching and supporting Science, Technology, Engineering, Mathematics (STEM), Design principles, and Problem solving. Robotics enables students to use their hands and minds to create like an engineer, artist, and technician does, all at once. It allows for instantaneous application of scientific and mathematical principals. In today's education system with its budgetary constraints, middle and high schools are on a constant search for cost-effective exciting ways to deliver high-impact programs that integrate technology with multiple disciplines while preparing students for careers in the twenty-first century. Educators quickly see the advantages that robotics projects and curriculum provide by linking in a cross-curriculum method with other disciplines. Additionally, robotics can provide more affordability and reusability of equipment as compared to other prepackaged options.

It is important for all members of society to have an understanding of the technology that surrounds us. When taught in schools, it allows students to experience a true interdisciplinary lesson while studying a cutting edge and exciting topic. Also, the aesthetics which go into the design and creation of robots allow students to experiment with an artistic side, while working through technical principals. This combination rewards participants on a plethora of different learning levels.

Course Schedule

Sl.No	Course Name	Theory hrs	Practical hrs	Total Hrs
1	Robotics	10	44	54

The Chapter wise Class hour Schedule is given below

Chapter 1: Introduction to Robotics

Introduction to Extensive Field of ROBOTICS - Application of Robotics: Industrial, Medical, Entertainment. Introduction to Embedded Robotics with Basics of hardware and software - New and Upcoming Technologies

Chapter 2: Introduction to Manual and Autonomous Robots

Different types of Manual Robots - Motor Principle explanation – DPDT/Key connections demystified - Gear assembly and calculations - Controlling Motors using DPDT/Key



Introduction to Autonomous Robot - Interaction between real and digital world - Concepts of artificial intelligence - Introduction to Infrared light - Introduction to IR Sensors - Testing of IR sensors - Detecting white and black surface with digital IR sensors - IR range detection - Monitoring analog and digital sensors

Chapter 3: Driver Hands-On

A Review on H-Bridge Concepts – H-Bridge IC Pin Diagram and Its functionalities – A review on NPN Darlington Pair Transistors – NPN Darlington pair IC pin configuration – Interfacing H-Bridge IC and NPN Darlington Pair IC with Robotic Motors - Integrating different Sensors and Actuators

Chapter 4: Project Hands-On

Project 1: Line Following Robot

Project 2: Obstacle Avoiding Robot

Project 3: Wired Joy Stick controlled Robot

Project 4: Intelligent Headlight Managing Robot

Project 5: Shape Drawing Robot

Chapter 5: Wireless Bot

Project 1: VB.Net App. Controlled Robot using Zigbee

Project 2: Smart Bluetooth Android Controlled Robot

Project 3: Wireless Joy Stick controlled Robot using CC2500 Module

Project 4: Intelligent Security Bot

Project 5: Intelligent Inspection Robot

Project 6: 2D Security Locking system with Fire Sensing Robot

Project 7: Pick and Place Robot

Note: This Robotics Training Syllabus is only applicable for the candidates who completed Embedded System Training in any one of the above mentioned respective Micro Controller Syllabus.

***Conditions Apply**



Advanced Course In Special Target Devices

There are few advanced concepts to be covered in this particular training period such as widely used GSM technology, RFID technology, Zigbee Technology, Bluetooth and GPS to name a few including I2C Protocol too with RTC interface.

Where GSM (Global System for Mobile communication), is a digital mobile telephony system that is widely used in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA).

These have programming concepts which consists of AT Commands. AT commands are instructions used to control a modem. AT is the abbreviation of ATtention. Every command line starts with "AT" or "at". That's why modem commands are called AT commands.

To be specific in some places people usually misunderstand the name Zigbee (Company Name) as a module name and fight for the wireless module because they don't know the actual module name. Actually the module is named as CC2500. The CC2500 is a low-cost 2.4 GHz transceiver designed for very low-power wireless applications. The circuit is intended for the 2400-2483.5 MHz ISM (Industrial, Scientific and Medical) and SRD (Short Range Device) frequency band. The RF transceiver is integrated with a highly configurable baseband modem. The modem supports various modulations.

RFID (radio frequency identification) is a technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency (RF) portion of the electromagnetic spectrum to uniquely identify an object, animal, or person.

The GPS (Global Positioning System) is a "constellation" of 24 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location. The location accuracy is anywhere from 100 to 10 meters for most equipment.

The ESP8266 wifi module is a low-cost standalone wireless transceiver that can be used for end-point IoT developments. ESP8266 wifi module enables internet connectivity to embedded applications. It uses TCP/UDP communication protocol to connect with the server/client.

I2C is a multi-master bus, which means that multiple chips can be connected to the same bus and each one can act as a master by initiating a data transfer. I2C is used in many devices, especially RTC devices.



Course Schedule

Sl.No	Course Name	Theory hrs	Practical hrs	Total Hrs
1	Device Driver Training	10	65	75

The Chapter wise Class hour Schedule is given below

Project 1: Wireless Home appliances Control Using Embedded System

Project 2: Wireless SCADA Embedded System

Project 3: Direction controlled Robot using RFID technology

Project 4: Priority Access System using RFID technology

Project 5: Location Tracking System Using GPS

Project 6: Anonymous Theft Detection Using GSM technology

Project 7: Automobile Authentication Using GSM technology

Project 8: RTC DS1307 Interface Using I2C Protocol

Project 9: Receiver Interrupt Handling

Project 10: Train Tracking Using GSM and RFID technologies

Note: This Robotics Training Syllabus is only applicable for the candidates who completed Embedded System Training in any one of the above mentioned respective Micro Controller Syllabus.

***Conditions Apply**



Advanced Certification Course In VLSI

A VLSI FPGA course offers specialized training on designing complex digital systems using Very-Large-Scale Integration (VLSI) techniques and Field-Programmable Gate Arrays (FPGAs). This training equips learners with the necessary skills to design, implement, and test digital circuits on FPGA devices, which are widely used in various industries like telecommunications, automotive, consumer electronics, and defense. The course focuses on Verilog programming and FPGA-based hardware design, providing a comprehensive learning experience.

Key Features of a VLSI FPGA Course:

Comprehensive Curriculum:

- **Fundamentals of Digital Logic:** Introduction to digital circuits, Boolean algebra, and combinational/sequential circuits.
- **Verilog Programming:** A deep dive into Verilog HDL (Hardware Description Language), including syntax, operators, and coding styles for digital design.
- **FPGA Architecture:** Understanding FPGA architecture, including logic blocks (LUTs, CLBs), I/O blocks, and routing.

Course Schedule

Sl.No	Course Name	Theory hrs	Practical hrs	Total Hrs
1	VLSI	60	90	150

The Chapter wise Class hour Schedule is given below

Chapter 1: Introduction to VLSI, FPGA, and Digital Logic

Introduction to VLSI (Very-Large-Scale Integration): Understanding VLSI and its role in modern electronics - Evolution of VLSI: SSI, MSI, LSI, VLSI, and ULSI - VLSI design flow overview - Key VLSI design tools (CAD tools, synthesis tools, simulation tools) - Introduction to CMOS technology (CMOS logic gates, CMOS scaling, etc.) **Introduction to FPGA (Field-Programmable Gate Arrays): Overview of FPGAs:** Architecture and Components (LUTs, Flip-Flops, CLBs, I/O blocks) - FPGA families and manufacturers (Xilinx, Altera, Lattice, etc.) - **FPGA vs ASIC:** Pros and cons

FPGA development flow: Design, simulation, synthesis, and implementation - FPGA programming languages and tools (Verilog, VHDL, Vivado, Quartus) - **Introduction to Digital Logic Design:** Basic logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) - Combinational logic circuits (adders, multiplexers, decoders, encoders) - Sequential circuits (flip-flops, registers, counters) - Timing diagrams and state diagrams - Boolean algebra and simplification using Karnaugh maps

Chapter 2: Verilog HDL 1.0

Introduction to Verilog: Overview of Verilog HDL (Hardware Description Language) - Verilog syntax and structure - Module definition in Verilog - Data types in Verilog (wire, reg, integer, real) - Assignments in Verilog (continuous vs procedural assignments) - Combinational Logic Design in Verilog: Basic gates in Verilog: and, or, not, nand, nor, xor, xnor



Design of basic combinational circuits: Half adder, full adder, multiplexer, decoder, encoder - Structural and behavioral modeling in Verilog - Conditional statements in Verilog (if, case, else) - **Sequential Logic Design in Verilog:** Flip-flops and registers (D, T, JK, SR flip-flops) - Shift registers and their Verilog implementation - Counters: Synchronous vs Asynchronous counters - FSM (Finite State Machine) design using Verilog - Moore vs Mealy machines - State transitions and encoding

Chapter 3: Verilog HDL 2.0

Advanced Verilog Concepts: Tasks, functions, and system tasks - Timing and delays - Blocking vs. non-blocking assignments - Design and implementation in Verilog - **Synchronous and Asynchronous Design:** Setup/hold time and clock considerations - Designing asynchronous circuits - Pipelining and Parallelism: Design considerations - Applications in digital circuits.

Chapter 4: FPGA Design Flow and Toolchain

Introduction to FPGA: FPGA architecture - Applications and advantages of FPGAs - FPGA Design Flow: Design entry, simulation, synthesis - Place and route, configuration - **Configurable Logic Blocks (CLBs):** Internal architecture and functionality - Resource utilization - **Getting Started with FPGA Tools:** Overview of popular tools like Xilinx Vivado, Quartus Prime - Setting up and managing projects.

Chapter 5: Advanced FPGA Design Concepts

FSM (Finite State Machine) Design for FPGA: Advanced FSM design techniques for FPGA - Moore and Mealy state machine implementation in Verilog - Optimizing FSMs for FPGA - Simulating FSMs with testbenches

Memory and Storage in FPGA: Memory types in FPGA - Block RAM, distributed RAM, FIFOs - Implementing and interfacing with RAM in Verilog - Dual-port and single-port RAM - Using FPGA resources for efficient memory design

Pipelining and Timing Optimization: Introduction to pipelining in FPGA - Pipelining for high-speed design (e.g., in DSP applications) - Timing analysis and optimization in FPGA - Using multi-clock designs in Verilog

Chapter 6: High-Level FPGA Applications

DSP (Digital Signal Processing) on FPGA: Introduction to DSP concepts for FPGA - Implementing basic DSP algorithms (filters, FFT) in Verilog - Optimizing DSP designs for FPGA (using DSP blocks, pipelining) - Using FPGA for real-time signal processing - **High-Speed Serial Communication:** High-speed communication protocols: SPI, I2C, UART - Implementing communication modules in Verilog - Serial communication with external peripherals via FPGA - FPGA-based protocol conversion (e.g., RS232, SPI to I2C)

FPGA for Embedded System Design: Integrating FPGA with a microcontroller for embedded systems - Using FPGA for hardware acceleration (e.g., AI/ML) - Interfacing FPGA with external peripherals (sensors, displays, etc.)

Chapter 7: Advanced Project Design and Final Project

Designing a Complex FPGA Project: Structuring and managing large FPGA projects - Designing an FPGA-based project from specification to simulation - Integrating multiple modules and subsystems –



Final Project Implementation: Building a complete design (e.g., a digital communication system, video processing, or an IoT system) - **Writing testbenches and debugging the final design - Synthesizing, implementing, and testing the final project on FPGA hardware**

Project 1: Interfacing LED with FPGA

Project 2: Interfacing Switches with FPGA

Project 3: Interfacing 7 segment with FPGA

Project 4: Interfacing Keypad with FPGA

Project 5: Interfacing LCD with FPGA

Project 6: Interfacing Geared Motor with FPGA

Project 7: Interfacing Stepper Motor with FPGA.

Project 8: Using Timers on FPGA.

Project 9: Using Serial port of FPGA, Data Communication between FPGA micro controller and PC / Smart Phones.

Project 10: Robotics Project Using FPGA.

Project 11: Using ADC measuring light intensity.

Project 12: Measuring room temperature using Sensor (LM 35).

Evaluation Methods:

1. Weekly quizzes and assignments
2. Mid-course test on Verilog
3. Final project evaluation)



COMMUNICATION AND SKILLING PROGRAM

Basic

1. 8 Parts of Speech Definition [Basic]
2. Noun, Pronoun, Verb, Adjective, Adverb [All Basics]
3. Components of a sentence [Subject, Verb, Object]
4. Types of Sentence Structure [Simple, Compound]
5. Phrase, Clause
6. Types of Sentences [Purpose]
7. Conjunction = And, But, Because, If, Or, Either, Or, Neither, Nor, So, Yet, As, For, Whether, After, Before, Even, Once, Than, That, Which, While
8. Preposition = Is, On, At, From, To, After, During, Behind, Over, Between, Towards, Into, Opposite, Beside, Around, Under, With, By, Onto, Along, Among, Across, Away, Above, Below, Up, Down
9. Articles = A, An, The
10. Tenses = Simple, Continuous

Intermediate

1. Adjective, Adverb [Advance]
2. Preposition & Conjunction [In Detail]
3. Direct & Indirect Speech

Advance

1. Complex Sentences
2. Tenses [Perfect & Perfect Continuous]
3. Active & Passive Voice
4. Question Tag
5. Ellipsis
6. Gerunds



Technical Additional:

1. Vocabulary [Synonyms & Antonyms]
2. Phrasal Verbs
3. Idioms
4. One - word Substitution
5. Phrases
6. Punctuations
7. Prefix & Suffix

Non - Technical Additional:

1. Phonetics [American & British Accent]
2. Speech [Prepared & Non - Prepared]
3. Listening [Speed Writing]
4. Email writing
5. Book Reading [Synonyms & Antonyms Findings]
6. Email writing
7. Resume Build up
8. Translation
9. Mock Interviews
10. Public Speaking
11. Interpersonal Skills
12. Personality Development
13. Workplace Etiquette





FULL STACK DEVELOPMENT IN JAVA (150 HOURS)

MODULE-1 20Hrs

INTRODUCTION TO JAVA FULL STACK DEVELOPMENT

- ✓ Overview of Full stack Development
- ✓ Key Technologies in Java Full Stack
- ✓ Client-Server Architecture
- ✓ Installation of development Environments and Tools such as IDE's and Version Control.

FRONT END WEB DEVELOPMENT

- ✓ HTML5
- ✓ CSS3
- ✓ Responsive web design with Media queries
- ✓ Basic Web page development.

MODULE-2 25Hrs

CORE JAVA PROGRAMMING

- ✓ Basics of Java Concepts
- ✓ OOP concepts in Java
- ✓ Exception Handling
- ✓ Collections Framework
- ✓ Multithreading and Concurrency
- ✓ File Handling in Java.

BASICS OF JAVASCRIPT

- ✓ Core concepts in JS
- ✓ DOM manipulation and Events
- ✓ Basic Validation and Debugging
- ✓ Basics of modules and Classes in JS.

MODULE-3 20Hrs

- ✓ DATABASE MANAGEMENT SYSTEM
- ✓ Basics of SQL
- ✓ Role of Subqueries in SQL
- ✓ Basics of NoSQL
- ✓ Introduction to MongoDB
- ✓ CRUD operations

DATABASE CONNECTIVITY

- ✓ Basics of JDBC
- ✓ Introduction to Hibernate using ORMs.



MODULE-4 20Hrs

BACKEND WEB DEVELOPMENT

- ✓ Java Servlets
- ✓ Servlets lifecycle and Session Management
- ✓ Basics of JSP and JSTL.

SPRING FRAMEWORK

- ✓ Spring Framework and Modules
- ✓ Dependency Injection and IoC.

MODULE-5 15Hrs

SPRING MVC

- ✓ RESTful API
- ✓ Basics of SpringBoot
- ✓ Connecting with Database using Spring Data JPA
- ✓ Git Vs GitHub

PROJECT DEVELOPMENT

- ✓ Planning and Designing
- ✓ Implementation of Project
- ✓ Integration and Deployment
- ✓ Testing and Debugging

