Karmaveer Bhaurao Patil University, Satara

Syllabus for

Skill Level - 4 (Hardware Assistant)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2024-2025

Title of Skill Course: Advance in Hardware Assistant

1. Department: Department of Computer Application

2. Title: **Advance in Hardware Assistant**

3. Sector: Hardware and Networking

4. Year of implementation:2023

Course Structure

Skill Level	Theory Hours	Practical Hours	Total Hours	Credits	No. of students in batch
4	15	15	30	02	30

Syllabus

Course Objectives:

1. To understand the architecture of modern processors.
2. To explore the latest developments in processor design and performance enhancement techniques.
3. To gain knowledge of parallelism, pipelining, and multi-core processing.

Theory Syllabus (Contact Hrs: 15, Credits: 01)

Unit I: Advanced Storage Technologies
Introduction to Advanced Processor Architectures, Instruction Set Architectures (ISA Pipelining and Superscalar Architecture, Multi-core and Many-core Processors, Parallelism in Processor Design, Cache Memory and Memory Hierarchy, Energy-efficient Processor Design,

Unit II: Assembling and Disassembling a Computer
Introduction to Storage Technologies, Solid-State Drives (SSDs), Storage Area Networks (SAN), Network-Attached Storage (NAS), Data Deduplication and Compression, Cloud Storage Solutions, Emerging Storage Technologies

Practical Syllabus (Contact Hrs: 15, Credits: 01)

List of Experiments ------------------------------------- 15 hrs
   1. Experiment with CPU Pipelining
   2. Multi-core Processor Performance Benchmarking
   3. Cache Memory Simulation and Optimization
   4. Building and Testing a RISC-V Processor
   5. Implementing a Network-Attached Storage (NAS) System

Course Outcomes:

1. Students will be able to analyze and differentiate between different processor architectures.

2. They will gain skills to optimize hardware performance through pipelining and parallelism.
3. Understanding of modern trends and innovations in processor design

Reference Books:

1. "CompTIA A+ Certification All-in-One Exam Guide" by Mike Meyers
2. "The Complete PC Upgrade and Maintenance Guide" by Mark Minasi
3. "How Computers Work" by Ron White
4. "Upgrading and Repairing PCs" by Scott Mueller

BOS Sub Committee: **Expert:**

1. Mr. R. P. Suryawanshi   1. Mr. Ravindra Kulkarni
2. Mr. A. D. Phadatare   2. Mr. Hemant More