GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 5th Semester
Branch: Software Development
Subject Name: Introduction to Microprocessors
Subject Code: 1150204

With effective from academic year 2018-19

Type of course: Core
Prerequisite: Fundamentals of Digital Logic Design
Rationale: The modern digital systems including computer systems are designed with microprocessor as central device connected to memory and I/O devices. The subject introduces the students with basics of microprocessor, microprocessor architecture and programming, interfacing microprocessor with memory and various I/O (Input/Output) devices and introduction to the advance processors including RISC based processors.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	-	0	3	50	-	-	-	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Contents:

Sr. No.	Practical / Hands on Exercise	Teaching Hrs.	Module % Weightage
1	**UNIT–I** **Digital Design and VHDL** Introduction, Combinational Logic, Structural Modeling, Sequential Logic, Finite State Machines, Parameterized Modules, Testbenches **Arithmetic Logic Unit (ALU)** Introduction, Arithmetic Circuits, ALU, Number Systems	12	30
2	**UNIT–II** **Microprocessor I: Instruction Data Set. Machine Language** Introduction, Assembly Language, Machine Language, Programming, Addressing Modes, Lights, Camera, Action: Compiling, Assembling, and Loading, Odds and Ends	10	20
3	**UNIT–III** **Microprocessor II: Control and Datapath Design. Single-Cycle Processor** Introduction, Performance Analysis, Single-Cycle Processor **Microprocessor III: Control and Datapath Design. Multi-cycle Processor** Introduction, Performance Analysis, Multicycle Processor, Pipelined Processor	10	20
4	**UNIT–IV** **Memory systems and I/O.** Introduction, Memory System, Caches, Virtual Memory, Memory-Mapped I/O, Memory map, I/O Devices, Buses and organization	10	30
	Total	**42**	

Reference Books:

1. Microprocessor Architecture, Programming, and Applications with the 8085, Ramesh S. Gaonkar, Penram International.
2. Computer System Architecture, M. Morris Mano, Pearson

3. Microprocessor &Interfacing -Douglas Hall, TMH
4. Fundamentals of Microprocessor, M.K. Ghodki, Khanna Publishing House
5. Advance Microprocessor, A.K. Gautam, Khanna Publishing House

Suggested Specification table with Marks (Theory): (For BVOC only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	0	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO-1	Understand the Digital Design and ALU	30
CO-2	Understand the Instruction Data Set and Machine Language	20
CO-3	Understand the Single Cycle Processor and Multi Cycle Processor	20
CO-4	Understand the memory system and I/O Management.	30

List of Open Source Software/learning website :

-Open source simulator for 8085 processor
-www.nptel.ac.in
-www.intel.com
-www.cpu-world.com