JESUS GROUP OF ORGANIZATIONS

SARDAR RAJA COLLEGE OF ENGINEERING

ALANGULAM

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

MICRO LESSON PLAN

SUBJECT NAME	**:**	**MICROPROCESSOR AND MICRO CONTROLLER**
SUBJECT CODE	**:**	**EC2304**
YEAR/SEM	**:**	**III / V**
BRANCH	**:**	**ECE**

STAFF NAME: Mr.M.VELLAPANDIAN

Asst.Prof / ECE

EC2304 MICROPROCESSOR AND MICROCONTROLLER L T P C
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UNIT I INTRODUCTION TO 8 BIT AND 16 BIT MICROPROCESSORS – H/W ARCHITECTURE 9

Introduction to microprocessor, computer and its organization, Programming system, Address bus, data bus and control bus, Tristate bus, clock generation, Connecting Microprocessor to I/O devices , Data transfer schemes, Architectural advancements of microprocessors. Introductory System design using microprocessors, 8086 – Hardware Architecture, External memory addressing, Bus cycles, some important Companion Chips, Maximum mode bus cycle, 8086 system configuration, Memory Interfacing, Minimum mode system configuration, Maximum mode system configuration, Interrupt processing, Direct memory access.

UNIT II 16 BIT MICROPROCESSOR INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING 9

Programmer's model of 8086, operand types, operand addressing, assembler directives, instruction set - Data transfer group, Arithmetic group, logical group, control transfer group, miscellaneous instruction groups, programming.

UNIT III MICROPROCESSOR PERIPHERAL INTERFACING 9

Introduction, Generation of I/O Ports, Programmable Peripheral Interface (PPI)-Intel 8255, Sample-and-Hold Circuit and Multiplexer, Keyboard and Display Interface, Keyboard and Display Controller (8279), Programmable Interval timers (Intel 8253, 8254), D-to-A converter, A-to-D converter, CRT Terminal Interface, Printer Interface.

UNIT IV 8 BIT MICROCONTROLLER- H/W ARCHITECTURE, INSTRUCTION SET AND PROGRAMMING 9

Introduction to 8051 Micro-controller, Architecture, Memory organization, Special function registers, Port Operation, Memory Interfacing, I/O Interfacing, Programming 8051 resources, interrupts, Programmer's model of 8051, Operand types, Operand addressing, Data

transfer instructions, Arithmetic instructions, Logic instructions, Control transfer instructions, Programming

UNIT V - SYSTEM DESIGN USING MICRO PROCESSOR & MICROCONTROLLER 9

Case studies – Traffic light control, washing machine control, RTC Interfacing using I2C Standard- Motor Control- Relay, PWM, DC & Stepper Motor.

L: 45, T: 15, TOTAL= 60 PERIODS

TEXT BOOKS

1. Krishna Kant, "MICROPROCESSORS AND MICROCONTROLLERS Architecture, programming and system design using 8085, 8086, 8051 and 8096". PHI 2007.
2. Douglas V Hall, "MICROPROCESSORS AND INTERFACING, PROGRAMMING AND HARDWARE" TMH, 2006.

REFERENCES

1. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D.MCKinlay " The 8051 Microcontroller and Embedded Systems", Second Edition, Pearson Education 2008.
2. Kenneth J. Ayala, "The 8086 Microprocessor: Programming & Interfacing The PC", Delmar Publishers, 2007.
3. A K Ray, K M Bhurchandi, Advanced Microprocessors and Peripherals, TMH, 2007.

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SUBJECT DESCRIPTION AND OBJECTIVES

DESCRIPTION

The Intel 8085 is an 8-bit microprocessor introduced by Intel in 1977. It was binary compatible with the more-famous Intel 8080 but required less supporting hardware, thus allowing simpler and less expensive microcomputer systems to be built. The 8086 (also called iAPX 86) is a 16-bit microprocessor chip designed by Intel between early 1976 and mid-1978, when it was released. The 8086 gave rise to the x86 architecture of Intel's future processors. The Intel 8088, released in 1979, was a slightly modified chip with an external 8-bit data bus (allowing the use of cheaper and fewer supporting logic chips), and is notable as the processor used in the original IBM PC.

A peripheral is a device that is connected to a host computer, but not part of it. It expands the host's capabilities but does not form part of the core computer architecture. It is often, but not always, partially or completely dependent on the host. A peripheral is generally defined as any auxiliary device such as a computer mouse, keyboard, hard drive, etc. that connects to and works with the computer in some way. According to the most technical definition, the only pieces of a computer *NOT* considered to be peripherals are the central processing unit, power supply, motherboard, and computer case.

The Intel MCS-51 (commonly referred to as 8051) is Harvard architecture, single chip microcontroller (μC) series which was developed by Intel in 1980 for use in embedded systems. One particularly useful feature of the 8051 core was the inclusion of a boolean processing engine which allows bit-level boolean logic operations to be carried out directly and efficiently on select internal registers and select RAM locations. The MCS-51 UARTs make it simple to use the chip as a serial communications interface.

8051 chips are used in a wide variety of control systems, telecom applications, robotics as well as in the automotive industry. By some estimation, 8051 family chips make up over 50% of the embedded chip market.

OBJECTIVES

- To introduce microprocessors and basics of system design using microprocessors.
- To introduce h/w architecture, instruction set and programming of 8085 microprocessor.
- To introduce the h/w architecture, instruction set and programming of 8086 microprocessor.
- To introduce the peripheral interfacing of microprocessors.
- To introduce through case studies, the system design principles using 8085 and 8086.
- To introduce the h/w architecture, instruction set, programming and interfacing of 8051 microcontroller.

MICRO LESSON PLAN

Week	Hours	LECTURE TOPICS	Reading
UNIT I - Introduction to 8 bit and 16 bit microprocessors – H/W architecture			
I	1	Introduction to microprocessor, computer and its organization	T1
	2	Programming system, Address bus, data bus and control bus, Tristate bus, clock generation	T1
	3	Connecting Microprocessor to I/O devices, Data transfer schemes	T1
	4	Architectural advancements of microprocessors, Introductory System design using microprocessors	T1
	5	8086 – Hardware Architecture, External memory addressing (AV Class)	T1
	6	Bus cycles, some important Companion Chips, Maximum mode bus cycle, 8086 system configuration	T1
II	7	Memory Interfacing	T1
	8	Minimum mode system configuration, Maximum mode system configuration, Interrupt processing	T1
	9	Direct memory access	T1
	10	Tutorial	T1
	11	Tutorial	T1
	12	Tutorial	T1
UNIT II - 16 Bit Microprocessor Instruction Set And Assembly Language Programming			
III	13	Introduction, Programmer's model of 8086 (AV Class)	T1
	14	operand types, operand addressing	T1
	15	assembler directives, instruction set	T1
	16	Data transfer group	T1
	17	Arithmetic group	T1
	18	logical group	T1
IV	19	control transfer group	T1
	20	miscellaneous instruction groups	T1
	21	programming	T1
	22	Tutorial	T1
	23	Tutorial	T1
	24	Tutorial	T1
UNIT III - Microprocessor Peripheral Interfacing			
V	25	Introduction, Generation of I/O Ports	T1
	26	Programmable Peripheral Interface (PPI)-Intel 8255	T1
	27	Sample-and-Hold Circuit and Multiplexer (AV Class)	T1
	28	Keyboard and Display Interface	T1
	29	Keyboard and Display Controller (8279)	T1
	30	Programmable Interval timers (Intel 8253, 8254)	T1
VI	31	D-to-A converter	T1
	32	A-to-D converter	T1
	33	CRT Terminal Interface, Printer Interface	T1
	34	Tutorial	T1
	35	Tutorial	T1
	36	Tutorial	T1

Week	Hours	LECTURE TOPICS	Reading
UNIT IV - 8 Bit Microcontroller- H/W Architecture, Instruction Set And Programming			
VII	37	Introduction to 8051 Micro-controller, Architecture	T1
	38	Memory organization, Special function registers	T1
	39	Port Operation, Memory Interfacing	T1
	40	I/O Interfacing, Programming 8051 resources, interrupts	T1
	41	Programmer's model of 8051, Operand types, Operand addressing (AV Class)	T1
	42	Data transfer instructions	T1
VIII	43	Arithmetic instructions	T1
	44	Logic instructions	T1
	45	Control transfer instructions, Programming	T1
	46	Tutorial	T1
	47	Tutorial	T1
	48	Tutorial	T1
UNIT V - System Design Using Micro Processor & Microcontroller			
IX	49	Introduction	T1
	50	Case studies – Traffic light control	T1
	51	washing machine control	T1
	52	RTC Interfacing using I2C Standard	T1
	53	Motor Control	T1
	54	Relay	T1
X	55	PWM	T1
	56	DC Motor	T1
	57	Stepper Motor (AV Class)	T1
	58	Tutorial	T1
	59	Tutorial	T1
	60	Tutorial	T1

Prepared By:- Mr.M.Vellapandian

Asst.Prof / ECE