Lecture Plan -1

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic:-Design of basic microprocessor architecture concepts.	Time Allotted:-
1.	**Introduction** The syllabus comprises six chapters . The microprocessor 8085 and 8086 are the most important chapters in the syllabus. along with this there are programmable peripheral interface IC 8255,DMA controller,Programmable interrupt controller IC 8259 . The **MICROPROCESSOR** is the most important component of the digital computer. It acts as the brain of the computer.	10 min
2	**Division of the Topic** -Introduction to microprocessor. -Evolution of microprocessor -Microprocessor architecture -World length of a computer or the microprocessor. -Important INTEL microprocessors	30 min
3.	**Conclusion** The central processing unit, which is built on a single IC, is called the microprocessor. A digital computer in which one microprocessor has been provided to act as a CPU Is called a microcomputer. The CPU of a large powerful digital computer contains more than one microprocessor. High-end powerful servers, mainframe computers, supercomputers etc. contains more than one microprocessor to act as the CPU. These microprocessors are placed in the CPU of the powerful computer in parallel. These computers are called a multiprocessor system.	5 min
4	**Question /Answer** Q .what is the word length of 4004 microprocessor? Ans. it is 4-bit Q. what is the difference between the 8085 and 8086 on the basis of world length? Ans. 8085 is 8-bit microprocessor while the 8086 is the 16-bit microprocessor.	5 min

Assignment to be given:-nil

Reference Readings:- C.M Gilmore “Microprocessors Principals and applications” MGH,

Lecture Plan -2

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Addressable memory	Time Allotted:-
1.	**Introduction** It is essential component of a digital computer. It is needed ti store programs, data and results. A computer uses a number of memory devices of different technologies .The speed of the memory should be very high and matches with the speed of CPU.	5 min
2	**Division of the Topic** Semiconductor memory Magnetic memory Optical disks CCD memory Program and data memory Memory addressing capability of a CPU	30 min
3.	**Conclusion** To match the speed of the CPU we require CACHE memory. It stores currently needed instructions and data of a program being executed. Semiconductor memory is static device. The secondary memory is a mass store device. The memory addressing capability of a CPU depends on the width of its address bus	5 min
4	**Question /Answer** **Q . What is Volatile memory?** Ans.A memory which holds its contents as long as power is on. Ex. RAM, Cache memory. **Q. How much is the memory capacity of a CPU , if it has 16 address lines**? Ans : 2^{16} =64 K	5 min

Assignment to be given:-

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

Lecture Plan -3

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Microprocessor's speed architectural characteristics, registers, instruction	Time Allotted:-
1.	**Introduction** The speed of a microprocessor is usually measured in number of instructions executed per second. The number of instructions executed per second is called throughput of the microprocessor.	5 min
2	**Division of the Topic** VON NEUMAN architecture HARVARD architecture DATA FLOW architecture RISC CISC	30 min
3.	**Conclusion** Throughput is generally expressed in MIPS. The performance of a processor is given in MFLOPS. For online transactions processing applications, computer performance is measured in TPS. To increase the processing speed of a computer several sequential processors can be employed to form a multiprocessor computer system.	5 min
4	**Question /Answer** **Q .**what is the significance of MIPS? Ans. The throughput of the microprocessor is expressed in :MIPS is millions of instructions per second.	5 min

Assignment to be given:-

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -4

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Memory addressing architecture	Time Allotted:-
1.	**Introduction** Part of the programming flexibility for each microprocessor is the number and different kinds of ways the programmer can refer to data stored in memory. The more complicated the microprocessor's architecture, the more memory addressing modes it will have.	5 min
2	**Division of the Topic** Complexity Flexibilty Addressing modes	30 min
3.	**Conclusion** The need for a wide variety of addressing modes depends on the job we are doing with the microprocessor. Building sophisticated instrument, it may need extensive memory-addressing capability for system. As the complexity of the microprocessor grows, the number of different modes also grows.	5 min
4	**Question /Answer** Q: Why does 8 bit microprocessor take longer to fetch and execute a directly addressed instruction than it does to fetch and execute an indexed instruction? Ans: Because directly addressed instruction takes less no. of cycles to fetch and execute an instruction.	5 min

Assignment to be given:-nil
Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**

Lecture Plan -5

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-ALU, GPR's Control logic and internal data bus	Time Allotted:-
1.	**Introduction** The microprocessor is divided into three segments: ALU, Register array and control unit. ALU performs all arithmetic operations. The registers are used to store data temporarily. The control unit provides the necessary timings and control signals to all the operations in the microprocessor. .	5 min
2	**Division of the Topic** -ALU Register array Control Unit Internal data bus	30 min
3.	**Conclusion** The bus carries the information between the microproceor and memory and I/Os. Various registers are used to store data temporary inside the microprocessor. The execution of all the instruction is controlled by the control unit.	5 min
4	**Question /Answer** **Q . What is the function of control unit?** **Ans:** It provides the necessary timings and control signals to various blocks of the microprocessor.	5 min

Assignment to be given:-

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -6

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-II

S. No.	Topic :-Instruction Set and mnemonics	Time Allotted:-
1.	**Introduction** A command in binary that is recognized and executed b the computer to accomplish a task. Some are designed with one word and some require multiple words. The entire group of instructions called instruction set. The format in which we write the instructions called mnemonics. The instruction mnemonics has two parts opcode and operands.	5 min
2	**Division of the Topic** 1 byte instruction 2 byte instructin 3 byte instruction	30 min
3.	**Conclusion** The necessary step to that a CPU carries out to fetch an instruction and necessary data from the memory and to execute it ,constitute the instruction cycle. The instruction cycle consist of fetch cycle and the execute cycle. In fetch cycle a CPU fetches opcode from the memory. The first byte of an instruction is the opcode. The necessary step which are carried out to get data if any from the memory and to perform the specific operation specified by the instruction constitute an execute cycle.	5 min
4	**Question /Answer** Q . What are the two parts of instruction? Ans: Opcode that is operation code and operand that is data on which the operation to be performed.	5 min

Assignment to be given:-.

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -7

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Basic instruction types	Time Allotted:-
1.	**Introduction** The instruction is a command to the microprocessor to perform a given task on specified data. The instruction has opcode and operand.The opcode fetched from the memory goes to the data register and then to the instruction register. From the instruction register it goes to the decoder circuitry which decodes the instruction. After the instruction is decoded ,execution begins. .	10 min
2	**Division of the Topic** **Data transfer instructions** **Arithmetic instructions** **Logical instructions** **Branch instructions:** Conditional branch instructions Un conditional branch instructions	25 min
3.	**Conclusion :** The logical instructions perform logical operations on the data in registers or memory. The branch instructions change the normal sequence of the program .the conditional branch instructions transfer the program to the specified label when certain condition is satisfied .the unconditional branch instructions transfer the program to the specified label unconditionally.	5 min
4	**Question /Answer** Q .Which set of the instruction affects the flag? Ans . Arithmetic and Logical instructions effect the status flags. Q. what is the meaning of ANA r? Ans Logically AND the content of the register with the accumulator	5 min

Assignment to be given:-Explain the following instructions: RCL,RAR,RCR,ROL

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -8

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Addressing modes	Time Allotted:-
1.	**Introduction** Each instruction requires some data on which it has to operate. These are various techniques to specify the data for instruction. These techniques are called the addressing modes. Intel 8085 uses the following addressing modes: 1 Direct addressing 2 register addressing 3.register indirect addressing 4 immediate addressing .	5 min 30 min
2	**Division of the Topic** Direct addressing with example -Examples of register addressing -Examples of register indirect addressing -Immediate addressing -Implicit addressing	
3.	**Conclusion** **Intel 8085** is an 8-bit microprocessor. It handles 8-bit data at a time. One byte consists of 8-bits. A memory location for 8085 is designed to accommodate 8-bit data. If 16-bit data are to be stored, they are to be stored in consecutive memory location. The address of memory location is of 16 bits i. e. 2 bytes. There are various techniques to specify the data for the instructions. Therefore the instructions may be single byte, two byte or the three byte instructions.	5 min
4	**Question /Answer** Q. In the implicit addressing mode where is the data? Ans. Accumulator. These instructions operate on the content of the accumulator. Q. What is the meaning of MOV A, B? Ans Move the content of register B to register A..	5 min

Assignment to be given:-What is difference between stack and subroutine?

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -9

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Microprocessor I/O connecting I/O put to microprocessor	Time Allotted:-
1.	**Introduction** A, microprocessor combined with memory and input/output, forms a microcomputer. The microprocessor is the heart of a microcomputer. In a microbased system the designer has to select suitable memories and input and output devices for his task and interface them to the microprocessor.	5 min
2	**Division of the Topic** Memory mapped I/O scheme I/O mapped I/O scheme. Memory and I/O interfacing Data transfer scheme 8255	30min
3.	**Conclusion** The main function of the 8255 is to interface peripheral devices to the microcomputer. It has three 8-bit ports, namely port A, port B and port C. The port C is further divided into two of 4-bit ports, port c upper and port c lower. Thus a total four ports are available. Two 8-bit ports and two 4-bit ports. Each port can be programmed as the input or the output port.	5 min
4	**Question /Answer** Q How many lines are present in the data bus of the 8255? Ans. 8 parallel lines Q. What is the electrical voltage requirement for the operation of the 8255? Ans.5 V dc supply	5 min

Assignment to be given:-. Explain the pin diagram of 8255 PPI chip.

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH
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Lecture Plan -10

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Polling and Interrupts and Interrupt Controller	Time Allotted:-
1.	**Introduction** The interrupt I/O is a process of data transfer where an external device or a peripheral can inform the processor that it is ready for communication and it requests attention. The processor is initiated by an external device and is asynchronous, meaning that it can be initiates at any time without reference to the system clock.	5 min
2	**Division of the Topic** -Interrupt controller 8259	30min
3.	**Conclusion** The interrupt process allows the microprocessor to respond to these external requests for attention or service on a demand basis and leaves the microprocessor free to perform other tasks. On the other hand, in the polled or the status check I/O, the microprocessor remains in a loop, doing nothing, until the device is ready for data transfer.	5 min
4	**Question /Answer** **Q: What is EI and DI ?** Ans: Enable Interrupt and Disable Interrupt.	5 min

Assignment to be given:-

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH
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Lecture Plan -11

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-DMA controller	Time Allotted:-
1.	**Introduction** Direct Memory Access is an I/O technique commonly used for high speed data transfer; for ex. data transfer between system memory and floppy disk. In status check I/O and interrupt I/O, data transfer is relatively slow because each instruction needs to be fetched and executed..	10 min
2	**Division of the Topic** Introduction to 8257 Control word of 8257 Status word of 8257	30 min
3.	**Conclusion** The main function of the 8257 is to transfer the data between slow peripheral devices and microprocessor through HOLD and HLDA signals. It is a four channel , direct memory access controller. It means that four peripherals can request data transfer and the request priorities are determined internally.	5 min
4	**Question /Answer** Q : To perform the data transfer function how many buses are required? Ans: Data bus, Address bus, R/W control signals and control signals.	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -12

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Introduction 8051 architecture and programming model	Time Allotted:-
1.	**Introduction** A microcontroller has a CPU , fixed amount of RAM, ROM, I/O ports and timers all are embedded on a single chip. 8051 is 8 bit microcontroller which has 128 bytes of RAM, 4K bytes of on chip ROM, two timers, one serial port and four ports on a single chip.	10 MIN
2	**Division of the Topic** Architectural block diagram of 8051 Programming model	30 MIN
3.	**Conclusion** Microprocessor and microcontrollers are widely used in embedded system products. An embedded product uses a microcontroller to do one and only one task. ex. printer, TV remote control and etc.	5 MIN
4	**Question /Answer** Q: What is the difference between microprocessor and microcontroller? Ans: Microcontroller has CPU , fixed amount of RAM, ROM, I/O ports and timers all are embedded on a single chip but in microprocessor they are on different chips.	5 MIN

Assignment to be given:-

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH

Lecture Plan-13

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Internal RAM and registers	Time Allotted:-
1.	**Introduction** The internal RAM of 8051 is divided in many different ways. The first 32 RAM locations are addressable as registers or as memory locations. By calling some memory locations registers, we can access them with single[byte instructions. These allow the programmer to write very efficient code.	10 MIN
2	**Division of the Topic** Register bank Registers Scratch pad Stack pointer Program status word	30 MIN
3.	**Conclusion** The programmer must select the bank to be used before one of the eight registers is addressed. The bank selection stays until the programmer changes it or the processor is reset.	5 MIN
4	Question /Answer Q. What is the purpose of data pointer register? Ans: It is a 16 bit register holds a 16 bit address used when addressing external memory.	5 MIN

Assignment to be given:-

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH

Lecture Plan-14

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-I/O parts	Time Allotted:-
1.	**Introduction** It has four 8-bit bidirectional I/O ports, each has special characteristics and three of the ports can be used in several different ways.	10 min
2	Division of the Topic Bidirectional port Multiplexed address data bus Full duplex serial port External memory write/read strobe	30 min
3.	Conclusion Most of the 8051 parallel I/O ports have a dual function. That is, they can perform another I/O related function, or they can act as an 8 bit bidirectional I/O port.	5 min
4	Question /Answer Q. What are the two purposes of port 2? A. Port 2 can be used for general purpose 8 bit bidirectional I/O ports and external memory data bus	5 min

Assignment to be given:-

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH
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Lecture Plan -15

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Interrupt system	Time Allotted:-
1.	**Introduction** .There are five different ways to interrupt 8051. Two of these are from external electrical signals. The other three are caused by 8051 I/O hardware operations.	10 min
2	**Division of the Topic** Interrupt enable register Interrupt priority regiters Types of interrupts	30 min
3.	**Conclusion** There are two external and two counter-timer interrupts and one serial interface interrupt. The external interrupts can either be transition activated or level triggered. The counter-timer interrupts are caused by a 16– bit register overflow.	5 min
4	**Question /Answer** **Q** .What are the five sources of interrupt? Ans: IE0, TF0, IE1, TF1, R1 or T1. .	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan -16

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Instruction set	Time Allotted:-
1.	**Introduction** The 8051 instruction set has 111 instructions. There are 49 single-byte instruction, 45 two byte instructions, and 17 three-byte instructions.	10 min
2	**Division of the Topic** Data transfer instructions Arithmetic instructions Logical instructions Branch control instructions	30 min
3.	**Conclusion** The 8051 has single, double and triple byte instruction. Most instructions are single-byte instructions, because the 8051 instruction set is designed to generate efficient object code to fit in the limited program memory space.	5 min
4	Question /Answer Q .How many pins are there in DMA? Ans. 40 pins Q. What is DACK signal? Ans DMA Acknowledgement	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan-17

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Intel X86 family of advanced microprocessor	Time Allotted:-
1.	**Introduction** **IBM introduce**d 8086 and 8088 in 1970. The 8088 and 8086 evolved into faster versions, versions with greater memory addressing space, versions with advanced computing functions and versions which process 32 bit data words. The 80286 followed the original introductions and it was soon folloed by the 80386 and then the INTEL 486 (Pentium).	10 min
2	**Division of the Topic** Introduction to X86 family 80286 80386 Pentium	30min
3.	**Conclusion** The 286 was the basis for the IBM PC/AT. The 286 supports up to 16 Mbytes of memory, real and protected modes, and virtual memory management. The 386 is the first Intel 32 bit microprocessor. The 486 integrates a 386 microprocessor with advanced features..	5 min
4	**Question /Answer** Q. How much memory is required for 486 processor? Ans: 8 kbyte memory.	5 min

Assignment to be given:-

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**

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Lecture Plan-18

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic:- Programming model for X86 family	Time Allotted:-
1.	**Introduction** The 8088 and 8086 define the base programming model for entire X86 family of advanced microprocessors. The newer members of the X86 family of advanced microprocessors have greater computing power because they are faster, they use 32 bit registers instead of 16 bit registers.	10 min
2	**Division of the Topic** General purpose register Segment register Base register Stack pointer Flag register	30 min
3.	**Conclusion** All X86 processors have some level of code prefetching or code caching. X86 instructions can address immediate data, register or memory. When addressing memory, the X86 processors can use either direct or indirect addressing modes.	5 min
4	**Question /Answer** Q. What is block transfer mode? A. all bytes are transferred continuously after each transfer ,it decrements counts register and increment or decrement address register	5 min

Assignment to be given:-nil

Reference Readings:-

Lecture Plan-19

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic:- X86 addressing modes	Time Allotted:-
1.	**Introduction** The X86 processors have many different addressing modes which give the X86 instructions a great deal of power.	10 min
2	**Division of the Topic** Register Addressing -Immediate Addressing -Base Addressing -Index Addressing -Direct Addressing -Register Indirect -Based Indexed	30 min
3.	**Conclusion** The X86 memory addressing technique creates 64 Kbyte memory segments in the 16-bit processors and 1-Mbyte segments in the 32-bit processors.	5 min
4	**Question /Answer** Q .1 What is direct addressing? A. the operand is given in the instruction as an 8-bit or 16 –bit displacement. Q.2 What is base addressing? A. It is the content of bas register BX or BP.	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**

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Lecture Plan-20

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-X86 Instruction set and hardware	Time Allotted:-
1.	**Introduction** The X86 processors have many different instructions types. The X86 processor can work with single-bit, nibble, byte, word, double word, and extended double word data. depending on the addressing mode, each instruction can be used many different ways.	10 min
2	**Division of the Topic** -Instruction Format -Instruction templates -MOD and R/M bit patterns -MOV instruction coding examples	30 min
3.	**Conclusion** The X86 instruction set includes a group of instructions specifically designed to help high level languages run on the processor.	5 min
4	**Question /Answer** Q **.** What is POP? A. Pop source from stack.	5 min

Assignment to be given:-

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**

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Lecture Plan-21

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic: - Motorola 68XXX family of microporcessor	Time Allotted:-
1.	**Introduction** The 68000 is the original product. Although it has an internal 32-bit architecture, it uses a 16-bit data bus and a 24-bit memory address bus and therefore can address only 16 Mbytes of physical memory..	10 min
2	**Division of the Topic** -Introduction Programming model Various registers	30 min
3.	**Conclusion** **The** 68XXX is the CPU used in Apple's Macintosh series of microcomputer, in a number of CAD/CAE workstations, and in many advanced industrial control products.	5 min
4	**Question /Answer** Q .How much memory is addressed by 68000 processor? Ans: 16 Mbytes. .	5 min

Assignment to be given:-

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH

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Lecture Plan-22

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic: -68XXX addressing modes , instruction set and hardware	Time Allotted:-
1.	**Introduction** Like X86 processors, the 68XXX processors have many different addressing modes which give the 68XXX instructions s great deal of power. It allows the programmer to separate memory into areas for data and for instructions.	10 min
2	**Division of the Topic** -Register direct Register indirect Memory direct Memory indirect Absolute immediate	30 min
3.	**Conclusion** The 68XXX program control instructions allow the programmer to use subroutines and return from those subroutines.	5 min
4	**Question /Answer** **Q** . What is the meaning of ADDX? A. Add with extend.	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan-23

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic: - Data communication	Time Allotted:-
1.	**Introduction** The two commonly used standards to define what bytes mean in data communication are ASCII and EBCDIC. The way we control and organize communications data is called data communication.	10 min
2	**Division of the Topic** ASCII codes EBCDIC codes Synchronous control characters Synchronous Asynchronous	30 min
3.	**Conclusion** Different communication protocols are used to define the hardware or signaling level, the character level, and the control level. Most microcomputer-related data communications protocols are based on asynchronous transmissions. Communications with mainframe computers often use synchronous.	5 min
4	**Question /Answer** **Q .** How many bits are required for ASCII code? Ans: 7 bits.	5 min

Assignment to be given:-

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**

Doc. No.: DCE/0/15
Revision :00

Lecture Plan-24

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :- Parallel I/O and serial communication	Time Allotted:-
1.	**Introduction-** The parallel I/O port is the most basic I/O port. It uses many of the same parts as a memory system. The UART is built around a shift register which performs the parallel to serial and serial to parallel conversion.	10 min
2	**Division of the Topic** Parallel I/O card block diagram UART RS232	30 min
3.	**Conclusion** To send over a serial transmission line, we must convert the parallel data in the microprocessor to serial data. This is done with a device called UART.	5 min
4	**Question /Answer** Q . Define baud rate Ans: No. of bits transmitted per second.	5 min

Assignment to be given:-Explain addressing modes of 8086.

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

Lecture Plan-25

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Serial interface and UART modems	Time Allotted:-
1.	**Introduction-**	10 min
2	**Division of the Topic** UART Baud rate Framing error Parity error	30 min
3.	**Conclusion** A parity check can only catch odd errors. Any even number of errors will not be caught by the parity check. The most common serial transmission line is the one which meets the EIA standard.	5 min
4	**Question /Answer** Q .What does Parity error means? Ans: A logic 1 in this bit means the UART detected an odd or even parity error.	5 min

Assignment to be given:-Give coding example for move between register and memory location

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan-26

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-I/O devices, D/A and A/D interface	Time Allotted:-
1.	**Introduction-** Special keyboards and displays are often used with microprocessor based systems which perform a special, instead of a general purpose job.	10 min
2	**Division of the Topic** Communication between machine and microprocessor keyboard Debouncing Display A/D converter D/A converter	30 min
3.	**Conclusion** Digital to analog converters are often made as integrated circuits to give fast settling times. When microprocessor based devices communicate with people , they often use displays and keyboards with alphanumeric characters.	5 min
4	**Question /Answer** Q .How many keys have a special keyboards? Ans: 90 to 100 keys.	5 min

Assignment to be given:-Give coding example for move between register and memory location

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan-27

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	**Topic** :- Introduction to the design process	**Time Allotted:-**
1.	**Introduction-** Few steps are required to develop a complete microprocessor based product. Only small microprocessor based products are entirely designed by one individual.	10 min
2	**Division of the Topic** Writing a specification Creating a design Implementing the design in code Demonstrating a final product	30 min
3.	**Conclusion** Typical skills required to develop a microprocessor based product include electronic, software and mechanical.	5 min
4	**Question /Answer** Q .Who is digital design engineer? Ans: A person who develops the microprocessor based control circuits.	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan-28

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :- Preparing the specification	Time Allotted:-
1.	**Introduction-** The first step in developing a product is to create a specification. Each engineering group must expand the specification to provide the details needed for its area.	10 min
2	**Division of the Topic** RF designer Digital designer Mechanical engineer Software engineer Project engineer	30 min
3.	**Conclusion**	5 min
4	**Question /Answer** Q .1What questions must be answered by the engineering digital specification? Ans: 1) Does this design need a microprocessor? 2) How much ROM and RAM needed?	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
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Lecture Plan-29

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :- Developing a design, implementing, testing and regulatory compliance	Time Allotted:-
1.	**Introduction-** The main purpose for the design phase of any development process is to describe a way the functional requirements and specifications in the specification can be implemented. .	10 min
2	**Division of the Topic** Schematic diagram Design techniques Mechanical sketch Regulatory compliance	30 min
3.	**Conclusion** As each model is built, it is thoroughly tested to see if it complies with the specification and to see if errors found in earlier models have been corrected in the latest implementation.	5 min
4	**Question /Answer** Q: What is the major portion of the testing? Ans: To determine compliance with the FCC rules and regulations.	5 min

Assignment to be given:-nil

Reference Readings:- C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH
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Lecture Plan -30

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	**Topic :-Design tool for microprocessor development**	Time Allotted:-
1.	**Introduction** . When we develop products built with digital circuits, including microprocessor, we require electronic test equipment to analyze and troubleshoot.	10 min
2	**Division of the Topic** FCC Logical analyzer MDS Timing display Function generator	30 min
3.	**Conclusion** Before a microprocessor based product may be sold to the general public, it must be tested to show that it complies with the part 15 requirements and have a label showing that it completed this testing and certification	5 min
4	**Question /Answer** Q. Logical analyzer responds to which level? Ans: logical levels that is 1 or 0.	5 min

Assignment to be given:-Explain the conditional jump instructions.

Reference Readings:-

INTEL 8086/8088 MICROPROCESSO ARCHITECTUR,PROGRAMMING,Design AND INTERFACING BY –BHUPINDER CHHABRA
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

Lecture Plan -31

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	**Topic :-**LOGICAL, SHIFT AND ROTATE INSTRUCTIONS	**Time Allotted:-**
1.	**Introduction** These three instructions come under the category of bit manipulation instructions. Logical instructions include like logical AND,OR,XORetc.	10 min
2	**Division of the Topic** - AND ,OR,XOR,Test,Not - SHL,SAL,SAR,SHR - ROL,ROR,RCL,RCR	30 min
3.	**Conclusion** The shift count may be specified as a constant 1 .AF flag is undefined in shift operation.	5 min
4	**Question /Answer** Q .What is SAR? A. Shift arithmetic right. Q.What is RCR? A. Rotate right through carry	5 min

Assignment to be given:-nil

Reference Readings:- INTEL 8086/8088 MICROPROCESSO ARCHITECTURE ,PROGRAMMING, Design AND INTERFACING BY –BHUPINDER CHHABRA
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

Lecture Plan-32

Semester: -Ist sem Class:-ECE Course Code:-MEEC-501

Subject:-**ADVANCED MICROPROCESSOR AND MICROCONTROLLER** Unit:-I

S. No.	Topic :-Introduction To Assembler Directives & Operators	Time Allotted:-
1.	**Introduction** Assembler directives & operators are the instructions to the assembler concerning the program being assembled, they also are called as Pseudo instructions or Pseudo op-codes. These instructions are neither translated into machine code nor assigned any memory locations in the object file.	10 min
2	**Division of the Topic** Assembler Assembler directives:- ORG Define Byte Define double word END LABEL SEGMEN PROC -Operators:- SHORT TYPE	30min
3.	**Conclusion** These instructions are neither translated into machine code nor assigned any memory locations in the object file.	5 min
4	**Question /Answer** Q.Define DD. A. Double Word ,It creates storage for 32-bit double word variable. Q.Explain ENDP. A. End of Procedure	5 min

Assignment to be given:-Nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**

Lecture Plan-33

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-III

S. No.	Topic :- Programming Examples	Time Allotted:-
1.	**Introduction-** Write a assembly language program	10 min
2	**Division of the Topic** Addition of 8-bit 58H and 55 H Division of 32 –bit number Multiplication of two 8-bit	30 min
3.	**Conclusion** Using 8086 program like addition subtraction and multiplication can be done	5 min
4	**Question /Answer** Q1. STC INSTRUCTION A1. sets the carry flag Q2. CMC INSTRUCTION A2. compliments the flag Q3. STD INSTRUCTION A3. sets the directional flag	5 min

Assignment to be given:-nil

Reference Readings:- **C.M GILMORE "MICROPROCESSORS PRINCIPALS AND APPLICATIONS" MGH**
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

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Lecture Plan-34

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-V

S. No.	Topic :- Pin Diagram Of 8259 A	Time Allotted:-
1.	**Introduction** The programmable interrupt controller,8259A is a 28 pin IC. . It manages 8 levels of interrupts, can be configured in master-slave or cascade mode to handle up to 64 interrupts. .	10 min
2	**Division of the Topic** a) pin configuration	30min
3.	**Conclusion** It has a bidirectional non multiplexed lines .it has an active low control input line .it is used to read contents of internal register. It has INT and other pins	5 min
4	**Question /Answer** Q1. INT symbol A1. It is an interrupt out put line .it goes high when ever a valid interrupt request is activated.	5 min

Assignment to be given:- nil.

Reference Readings: - MICROPROCESSO ARCHITECTURE, PROGRAMMING, AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

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Lecture Plan-35

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-V

S. No.	Topic :- Block Diagram Of 8259 PIC	Time Allotted:-
1.	**Introduction** The programmable interrupt controller,8259A is a 28 pin IC. . It manages 8 levels of interrupts, can be configured in master-slave or cascade mode to handle up to 64 interrupts. .	10 min
2	**Division of the Topic** a) data transfer group b) Read/Write logic c)Cascade buffer d) CL e)ISR f)PR g) IMR	30min
3.	**Conclusion** The programmable interrupt controller (PIC) functions as an overall manager in an interrupt driven system environment. It accepts requests from the peripheral equipment, determines which of the incoming requests is of the highest priority, ascertains whether the incoming request has a higher priority value than the level currently being serviced, and issues an interrupt to the CPU based on this determination. This IC is compatible with µp 8085,8086 and 8088. .	5 min
4	**Question /Answer** Q. What does IMR stands for ? A Interrupt mask register Q2 what is the working of IMR A. it is a programmable register. It is used to make out unwanted interrupt request	5 min

Assignment to be given:-nil

Reference Readings: - MICROPROCESSO ARCHITECTURE, PROGRAMMING, AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS

Lecture Plan-36

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-V

S. No.	Topic :- Programming On Interrupt Controller 8259 PIC	Time Allotted:-
1.	**Introduction** The programmable interrupt controller,8259A is a 28 pin IC. . It manages 8 levels of interrupts, can be configured in master-slave or cascade mode to handle up to 64 interrupts. .	10 min
2	**Division of the Topic** -Command words :- -Initialization Command words (ICWs) -Operation Command words (OCWs) -Priority modes - End of interrupt -Poll command -Buffered mode	30min
3.	**Conclusion** The programmable interrupt controller (PIC) functions as an overall manager in an interrupt driven system environment. It accepts requests from the peripheral equipment, determines which of the incoming requests is of the highest priority, ascertains whether the incoming request has a higher priority value than the level currently being serviced, and issues an interrupt to the CPU based on this determination. This IC is compatible with µp 8085,8086 and 8088. .	5 min
4	**Question /Answer** Q. How many 8259As are required to have 64 interrupt inputs? A. 9 Q.What is the purpose of IRR in the 8259A. A. The IRR indicates which interrupts level are masked.	5 min

Assignment to be given:-Discuss the various ICWs & OCWs of 8259A.

Reference Readings: - MICROPROCESSO ARCHITECTURE, PROGRAMMING, AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER
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Lecture Plan -37

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-VI

S. No.	Topic :-Programmable Interval Timer	Time Allotted:-
1.	**Introduction** There are two basic modes of timer delay and counter.To operate a counter a 16- bit counter is loaded in its register and ,one command begins to decrement the count until it reaches 0	10 min
2	**Division of the Topic** Three independent 16- bit down counter Programmable counter modes Counting facility in both binary or BCD number system	30 min
3.	**Conclusion** Operating frequency (DC to 8 MHz and 10 MHz for 8254-2) 24 pin dual in –line package Single + 5V supply	5 min
4	**Question /Answer** Q .What is function delay mode? A . it can provide delay of any value ,but it uses soft ware to implement delay Q What is function counter mode? A .can count the pulses arriving at the port	5 min

Assignment to be given:- nil

Reference Readings:-**INTEL 8086/8088_MICROPROCESSO ARCHITECTURE ,PROGRAMMING, Design AND INTERFACING BY –BHUPINDER CHHABRA**
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Lecture Plan -38

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-VI

S. No.	Topic :-Programmable Interval Timer 8253	Time Allotted:-
1.	**Introduction** The 8253 is a programmable counter/timer chip. It is organized as 3 independent 16-bit counters, each with a count rate up to 2 MHz. .	10 min
2	**Division of the Topic** -Introduction to Programmable interval timer -Pin Diagram of 8253 - Explanation of pins -Block diagram of 8253	30 min
3.	**Conclusion** 8253 includes three counters (0, 1, and 2), a data bus buffer, read/write control logic, and a control register.	5 min
4	**Question /Answer** Q .What is function of mode 0? A. Interrupt on terminal count Q.What is function of mode 4? A. Software triggered strobe**.**	5 min

Assignment to be given:-Explain the pin diagram of 8253.

Reference Readings:-**INTEL 8086/8088 MICROPROCESSOR ARCHITECTURE, PROGRAMMING, Design AND INTERFACING BY –BHUPINDER CHHABRA**
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Lecture Plan -39

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-beyond syll

S. No.	Topic :-INTRODUCTION TO MICROCONTROLLER	Time Allotted:-
1.	**Introduction** A microprocessor has RAM, ROM, I/O, Timers externally attached. But in microcontroller all are available on one chip. .	10 min
2	**Division of the Topic** -Introduction to 8051 -Features of 8051 - Advantages -Comparison with various microcontroller.	30 min
3.	**Conclusion** 8051 is 8 bit microcontroller used in various embedded systems applications.	5 min
4	**Question /Answer** Q : What are the devices available on chip in microcontroller? Ans: RAM,ROM, I/O ports and timers.	5 min

Reference Readings:-8051 microcontroller by Mazidi

Lecture Plan -40

Semester: -Vth Class:-ECE-I Course Code:-MEEC-501

Subject:-MICROPROCESSOR AND INTERFACING Unit:-Beyond Syll

S. No.	Topic :Pin diagram and Functional diagram of 8051	Time Allotted:-
1.	**Introduction** 8051 has 4K bytes of on chip, 128 bytes of RAM, two timers, one serial port and four ports all on a chip. .	10 min
2	**Division of the Topic** -I-Pin Diagram of 8051 - Explanation of pins -Block diagram of 8051	30 min
3.	**Conclusion** Various versions of 8051/8052 microcontroller from various manufactures are available in the market.	5 min
4	**Question /Answer** Q .What is size of ROM available in INTEL 8051? Ans: 4K bytes.	5 min

Reference Readings:- 8051 microcontroller by Mazidi