Branch	Opto-Electronics Engg.(O01)		Semester	4

Course Code	402	Course Name	Microprocessor & Microcontroller

		Teach Hrs	Marks
Course Outcome 1	Explain 8085 Microprocessor, its architecture and memory mapping.		
Learning Outcome 1	Demonstrate the architecture of 8085 Microprocessor. **(Psychomotor)**	4	10
Contents	8085 Microprocessor: Architecture, Pin Diagram with function of each pin.		
Method of Assessment	Internal practical		
Learning Outcome 2	Define function of various blocks, buses and cycles of 8085. **(Cognitive)**	10	10
Contents	Block Diagram and its description- Register Array, ALU, Timing and Control Signals Address, Description of Address bus, data bus and control bus. Machine cycle & BUS Timing		
Method of Assessment	External Theory Exam		
Learning Outcome 3	Compare different memory mapping techniques and interrupts of 8085.**(Cognitive)**	10	10
Contents	Memory Interfacing, IO Interfacing, Block Diagram of Memory and I/O Interfacing, 8085 Interfacing Pins. Addressing modes of 8085. Interrupts and its types. Memory Mapped I/O & I/O mapped I/O		
Method of Assessment	External Theory Exam		

Branch	Opto-Electronics Engg.(O01)		Semester	4

Course Code	402	Course Name	Microprocessor & Microcontroller

Course Outcome 2	Identify the microcontroller 8051 and its architecture.	Teach Hrs	Marks
Learning Outcome 4	Model the architecture of Microcontroller 8051. **(Psychomotor)**	4	10
Contents	Introduction to micro- controller, Comparison between microprocessor and micro-controller, 8051 Microcontroller and its architecture, Pin diagram and its description		
Method of Assessment	Internal practical		
Learning Outcome 5	Explain block diagram and registers of Microcontroller 8051. **(Cognitive)**	10	10
Contents	Block diagram Futures of 8051 I/O ports Pins and their functions Registers 8051 data type, On-chip ROM memory and RAM Memory organization, register banks, stack and stack pointer, SFR registers, Registers - A, B, SP, DPTR, PC and SFRs.		
Method of Assessment	External Theory Exam		
Learning Outcome 6	Describe I/O ports and Machine cycles in 8051 Microcontroller. **(Cognitive)**	6	10
Contents	I/O ports structure and operation bit address. General Format and functions of each bit of PSW SFRs, machine cycle, Time delay calculations. Machine Cycles. Calculation of Time delay for different cycles of microcontroller.		
Method of Assessment	Internal Theory		

Branch	Opto-Electronics Engg.(O01)		Semester	4

Course Code	402	Course Name		Microprocessor & Microcontroller

Course Outcome 3	Develop the program using Assembly Language of 8085.	Teach Hrs	Marks
Learning Outcome 7	Identify different instructions formats and sets of Microprocessor 8085. **(Cognitive)**	10	10
Contents	Instruction Format Instructions Set and their classification. Data Transfer operation		
Method of Assessment	External Theory Exam		
Learning Outcome 8	Utilize the arithmetic, logic and branch operation in programming of 8085. **(Cognitive)**	10	10
Contents	Arithmetic operation Logic operation Branch Operation Stack, Subroutine and related instruction		
Method of Assessment	External Theory Exam		
Learning Outcome 9	Execute simple programs in 8085.**(Psychomotor)**	5	10
Contents	Write assemble and execute a simple program in 8085 on Arithmetic operation Logical operation Branch Operation Stack, Subroutine and related instruction		
Method of Assessment	External practical		

Branch	Opto-Electronics Engg.(O01)		Semester	4

Course Code	402	Course Name	Microprocessor & Microcontroller

Course Outcome 4	Write and execute assembly language programs for 8051 Microcontroller.	Teach Hrs	Marks
Learning Outcome 10	Classify addressing modes and instruction set of 8051 with example**(Cognitive)**	10	10
Contents	Addressing Modes: Immediate, Register, Direct, Indirect, Indexed, Relative and bit addressing Instruction set : Data Transfer, Arithmetic, Logical, Branching, and Machine Control		
Method of Assessment	External Theory Exam.		
Learning Outcome 11	Analyze particular programming concept on 8051 Microcontroller as per requirement. **(Cognitive)**	4	10
Contents	Arithmetic, logical instruction, Looping, Counting, sorting and Indexing.		
Method of Assessment	Internal Theory		
Learning Outcome 12	Develop programs to perform the operations on 8051 microcontroller.**(Psychomotor)**	4	10
Contents	Programs on arithmetic and logic instructions, Looping, Counting, sorting and Indexing. Data manipulation, Masking, Stack operation.		
Method of Assessment	External practical		

Branch	Opto-Electronics Engg.(O01)		Semester	4

Course Code	402	Course Name	Microprocessor & Microcontroller

Course Outcome 5	Describe Peripherals and its interfacing with 8085	Teach Hrs.	Marks
Learning Outcome 13	Illustrate Pin diagram and block diagram of various peripherals. **(Cognitive)**	10	10
Contents	Peripherals: PIN DIAGRAM,BLOCK DIAGRAM, INTERFACING WITH 8085 8255 programmable peripheral interface 8279 programmable key board interface 8259 programmable interrupt controllers 8257 DMA controller.		
Method of Assessment	External Theory Exam		
Learning Outcome 14	Demonstrate the interfacing of various peripherals with 8085. **(Cognitive)**	4	10
Contents	Interfacing of 8255, 8279, 8259 and 8257 with 8085		
Method of Assessment	Internal		
Learning Outcome 15	Develop assembly language program to use peripherals with 8085.**(Psychomotor)**	4	10
Contents	Develop assembly language program to use peripherals with 8085.		
Method of Assessment	Internal practical		

Suggested List of Experiments*:

S.N.	Experiment	CO
1	Identify the components of the microprocessor 8085 trainer.	CO302.1
2	Study of Pin diagram and architecture of 8085.	CO302.1
3	Study of Pin diagram and architecture of 8051.	CO302.2
4	Develop/Execute a simple program to move data from one register to the other.	CO302.3
5	Develop/Execute program immediate data between differentregisters	CO302.3
6	Develop/Execute a programon arithmetic orperations.	CO302.3
7	Develop/Execute an Assembly language program to convertHexadecimal to ASCII code conversion.	CO302.3
8	Develop/Execute Assembly language program to check whether given no is odd or even	CO302.3
9	Develop/Execute a program to add two numbers(binary, decimal and decimal)	CO302.3
10	Develop/Execute a program to convert data from one code to another code(binary grey)	CO302.3
11	Develop/Execute an Assembly language programs based on 8 bitLogical instructions.	CO302.3
12	Develop/Execute an Assembly language program to sumintegers from 0 to 9.	CO302.3
13	Develop a programto count negative values in given block ofdata.	CO302.3
14	Develop/Execute a Subroutine to find the square of given integer.	CO302.3
15	Develop/Execute an Assembly language program to sort givenarray of ten bytes in descending order.	CO302.3
16	Write a program of 8051 in assembly language programming for addition of two 8 bit numbers.	CO302.4
17	Write a program of 8051 in assembly language programming for subtraction of two 8 bit numbers	CO302.4
18	Write a program of 8051 in assembly language programming for multiplication of two 8 bit numbers	CO302.4
19	Write a program of 8051 in assembly language programming for division of two 8 bit numbers	CO302.4
20	Write and execute on kit assembly program to interface 8255 programmable peripheralinterface.	CO302.5
21	Write and execute on kit assembly program to interface 8279 programmable key board interface.	CO302.5
22	Write and execute on kit assembly program to interface 8259 programmable interrupt controllers.	CO302.5
23	Write and execute on kit assembly program to interface 8257DMA controller.	CO302.5

*Ten experiments in a semester as per the discretion of the subject teacher.

Major Equipment/Materials:

1.	Microcontroller 8051 trainer Kit
2.	8051 Simulator software (open source)
3.	Computer System(p-IV and latestversion)

4.	Peripheral Interfacing Trainerkits
5.	8085 Microprocessor TrainingKit
6.	Interfacing Card for MicroprocessorKit
7.	Microcontroller Development Board withProgrammer
8.	Universal EmbeddedTrainer
9.	Input InterfaceModule
10	Motor DriveModule
11	Embedded Training Kit
12	ADC/DAC Module
13	Computer InterfaceModule
14	Function Generator/ PulseGenerator
15	Cathode Ray Oscilloscope(C.R.O.)
16	DisplayModule

Reference Books/Web Portals:

S.N.	Title	Author	Publication
1	THE 8051 MICROCONTROLLER AND EMBEDDED SYSTEMS Using Assembly and C	Muhammad Ali Mazidi,Janice GillispieMazidi and Rolin D McKinlay	Pearson Second edition.
2	Microcontrollers : Principles And Applications	Pal Ajit	EEE, PHI ,New Delhi,(Latest edition)
3	The 8051 Microcontrollers: Architecture, Programming and Applications	Rao Dr. K Uma	Pearson Education India, New Delhi,(Latest edition)
4	The 8051 microcontroller and embedded systems	Mazidi Ali, Muhammad Mazidi Gillispie Janice	PHI, New Delhi,(Latest edition)
5	The 8051 Microcontroller: Architecture, Programming, and Applications	Kenneth Ayala J.	Thomson Delmar learning,(latest Edition)
6	The 8051 Microcontroller,	Mackenzie	Education India, New Delhi,(Latest edition)
7	Programming and customizing the 8051 microcontroller	Predko Michael	McGraw-Hill, International edition
8	Micrprocessor architecture programming and applicationwith 8085/8080A	Ramesh S. Gaonkar	Wiley Eastern Ltd.
9	Introduction to Microprocessor	Aditya P. Mathur	McGraw-Hill Inc.,US
10	Microprocessor & Interfacing	Dougus V. Hall	Mcgraw Hill Education (India) Private Limited
11	Microprocessors & Fundamentals	B. Ram	Dhanpat Rai Publications
	nptel.ac.in		
	swayam.gov.in		