FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF PHYSICS
COURSE CURRICULUM

PART-A: INTRODUCTION				
Program : Bachelor in Science *(Honors/Honors with Research)*			**Semester -VIII**	**Session: 2024-2025**
1	**Course Code**	**PHSE-12 T**		
2	**Course Title**	**Microprocessor**		
3	**Course Type**	**Discipline Specific Elective**		
4	**Pre-requisite** (if, any)	***As per program***		
5	**Course Learning. Outcomes (CLO)**	**After completion of this course a student will be able to-** ➢ *Understand the basics of digital computer, Clarify the concept of memories used in computer system* ➢ *Familiar with buses and registers available in microprocessor* ➢ *Understand the addressing modes, data transfer group, arithmetic group, logical group etc.Know about Assembly Language, High-Level and Area of applications of various languages* ➢ *Able to use Assembly Language for programming of microprocessor*		
6	**Credit Value**	**3 Credits**	***Credit = 15 Hours - learning & Observation***	
7	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**	

PART -B: CONTENT OF THE COURSE

Total No. of Teaching–learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**Digital Computer:** Generation of computer, Digital Computer, Its basic components: Input and output devices, Central Processing Unit (CPU) and its organization, **Primary memory:** Introduction, Types of Primary memory - RAM, SDRAM, SGRAM, DDR SDRAM, SIMM, DIMM, ROM, PROM, EPROM, EEPROM, **Secondary memory:** Construction and working principles of Hard Disc, Floppy Disc, Optical Disc, Magnetic Bubble Memory. Cache memory, Real and Virtual Memory. Memory hierarchy	11
II	**Microprocessor:** Introduction and evaluation, Architecture and functional organization of Intel 8085, ALU, Timing and Control unit, **Buses:** Address Bus, Data Bus and Control Bus. Bus architecture: PCI, ISA, USB and AGP. **Registers:** ACC, General purpose register, Stack pointer, Program counter, Instruction register, Temporary register. Processing speed of processor, Types of processors (Basic Idea), Opcode and Operand, Pin Diagram and Pin Configuration of 8085, Intel 8085 instructions, Instruction cycle, Timing diagram	12
III	**Instruction set of 8085:** Addressing modes, Data transfer group, Arithmetic group, Logical group, Branch group, Stack, I/O and Machine control group. **Programming of Microprocessor:** Assembly Language, High-Level languages. Advantages and Disadvantages of high-level languages, Area of applications of various languages, Stack, Subroutines, Modular programing, Structured programing	11
IV	**Assembly Language Programs:** Addition of two 8-bit number; sum 8-bit, Addition of Two 8-bit number; sum 16-bit, 8-bit subtraction, Shift an 8-bit/ 16-bit number left by 1-bit, Shift an 8-bit/ 16-bit number left by 2-bit,Find larger number of two numbers, Find the largest number in a data array, Find smaller number of two numbers, Find the smallest number in a data array, To arrange a series of numbers in Descending order, To arrange a data array in ascending order, 8-bit multiplication; product in 16-bit, 8-bit division	11
Keywords	***CPU, Memory, Microprocessor, Buses, Registers, Opcode, Instructions, Addressing mode, Assembly language, Programming.***	

Signature of Convener & Members (CBoS) :

10/6/24

PART–C: LEARNING RESOURCES

Text Books, Reference Books and Others

Text Books Recommended–

1. MicroprocessorArchitectureProgrammingandapplicationswith8085,R.S.Goankar,2002,PrenticeHall
2. Digital electronics and Microcomputers, R K Gaur, Dhanpat Rai Publications
3. Fundamentals of Microprocessors and Microcontrollers, B Ram, Dhanpat Rai Publications

Reference Books Recommended –

1. Introduction to microprocessor – Aditya Mathur, Tata McGraw Hills, New Delhi
2. Microprocessor8085: Architecture, Programming and interfacing, A.Wadhwa,2010,PHILearning
3. Microprocessors and Interfacing Devices, Rupender Singh & Sunita Jain, CBS Publications

Online Resources–

e-Resources / e-books and e-learning portals

1. https://www.freebookcentre.net/Electronics/MicroProcessors-Books.html
2. https://www.phindia.com/Books/ShoweBooks/MTMyNg/Microprocessors-Microcontrollers
3. https://books.google.co.in/books?id=P-n3kelycHQC&printsec=frontcover&redir_esc=y#v=onepage&q&f=false
4. https://www.youtube.com/watch?v=UjagUR2i_Ok
5. https://www.youtube.com/watch?v=dLGw66gKKkQ
6. https://www.classcentral.com/course/swayam-microprocessors-and-microcontrollers-9894
7. https://www.youtube.com/watch?v=hwwhsNOqqm8
8. https://www.youtube.com/watch?v=wUmi3roAqmk

PART -D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:	**100 Marks**
Continuous Internal Assessment (CIA):	**30 Marks**
End Semester Exam(ESE):	**70 Marks**

Continuous Internal Assessment (CIA): **(By Course Teacher)**	Internal Test / Quiz-(2): Assignment / Seminar - Total Marks -	**20 +20** **10** **30**	Better marks out of the two Test / Quiz **+** obtained marks in Assignment shall be considered against **30** Marks
End Semester Exam (ESE):	**Two section – A & B** Section A: **Q1**. Objective – **10 x1= 10** Mark; **Q2**. Short answer type- **5x4 =20Marks** Section B: Descriptive answer type qts.,**1out of 2** from each unit-**4x10=40 Marks**		

Name and Signature of Convener & Members of CBoS:

FOUR YEAR UNDER GRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF PHYSICS
COURSE CURRICULUM

PART-A: INTRODUCTION				
Program : Bachelor in Science *(Honors/Honors with Research)*			**Semester - VIII**	Session: 2024-2025
1	**Course Code**	**PHSE-12 P**		
2	**Course Title**	**Microprocessors**		
3	**Course Type**	**Discipline Specific Elective**		
4	**Pre-requisite** (if, any)	**As per Program**		
5	**Course Learning. Outcomes(CLO)**	**After completion of this course a student will be able to-** ➢ *Understand the working of logic gates and realization of Functions* ➢ *Clarify the concept of combinational logic circuits* ➢ *Understand the differences between MUX, DMUX, Encoder and Decoder and their use* ➢ *Familiar with basic memory elements (Flip-flop)*		
6	**Credit Value**	**1 Credits**	***Credit =30 Hours Laboratory or Field learning/Training***	
7	**Total Marks**	**Max. Marks:50**		**Min Passing Marks:20**

PART -B: CONTENT OF THE COURSE		
Total No. of learning-Training/performance Periods:30 Periods (30 Hours)		
Module	**Topics (Course Contents)** **At least 10 of the following or related Experiments**	**No. of Period**
Lab./ Experiment Contents of Course	1. Write the program using 8085 Microprocessor for Addition and Subtraction of numbers using direct addressing mode 2. Write the program using 8085 Microprocessor for Addition and Subtraction of numbers using indirect addressing mode 3. Write the program using 8085 Microprocessor for Multiplication by repeated addition 4. Write the program using 8085 Microprocessor for Division by repeated subtraction 5. Write the program using 8085 Microprocessor for Handling of 16-bit Numbers 6. Write the program using 8085 Microprocessor to Use of CALL and RETURN Instruction 7. Write the program using 8085 Microprocessor to add two hexa decimal & decimal numbers 8. Write the program using8085Microprocessor to subtract two hexadecimal & decimal numbers 9. Write the program using 8085 Microprocessor for Addition of two 8-bit numbers 10. Writetheprogramusing8085Microprocessor for Addition of two 16-bit numbers 11. Write a program to perform multiplication of two 8-bit numbers using bit addition method 12. Write a program to perform multiplication of two 8-bit numbers using bit rotation method 13. Write a program to perform division of two 8-bit numbers using Repeated Subtraction method 14. Write a program for Finding the largest and smallest number from an array 15. Write a program for Find 1's & 2's complement of a 8 bit number 16. Write a program to Transfer Block of data bytes from one memory location to another 17. Any Similar programming	**30**
Keywords	***Microprocessor, Addressing mode, CALL, RETURN, Programming***	

Signature of Convener & Members (CBoS):

10/6/24

PART–C: LEARNING RESOURCES

Text Books, Reference Books and Others

Text Books Recommended–

1. Microprocessor Architecture, Programming, and Applications with the 8085 by Ramesh S. Gaonkar
2. Microprocessors and Microcontrollers: Architecture, Programming and System Design 8085, 8086, 8051, 8096 by Krishna Kant
3. Fundamentals of Microprocessors and Microcontrollers by B. Ram
4. 8085 Microprocessor and its Applications by A. Nagoor Kani
5. The 8085 Microprocessor: Architecture, Programming and Interfacing by K. Udaya Kumar and B.S. Umashankar

Reference Books Recommended–

1. Digital Electronics: Theory and Practical- Virendra Kumar, New Age International Publications
2. Digital Electronics – A Comprehensive Lab Manual- Cherry Bhargava, B S Publication
3. Digital electronics experiment manual- Toger Tokheim, McGraw Hill
4. Handbook of Experiments in Electronics and Communication- B Sasikala & S P Rao, Vikas Publishing
5. Practical Digital Electronics Manual- Nigel P Cook, Prentice Hall

Online Resources–

e-Resources / e-books and e-learning portals

1. https://www.ssit.edu.in/dept/assignment/8085labmanual.pdf
2. https://gnindia.dronacharya.info/ECE/Downloads/Labmanuals/Microprocessor_Lab_Manual.pdf
3. https://people.iitism.ac.in/~download/lab%20manuals/ece/5.%20ECC211%20Microprocessor%20&%20Microcontroller%20Lab.pdf
4. https://www.technicalsymposium.com/microprocessor_lab.pdf
5. https://mjcollege.ac.in/images/labmannuals/MICROPROCESSORLABMANUALBIT281.pdf

PART-D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:	**50 Marks**
Continuous Internal Assessment (CIA):	**15 Marks**
End Semester Exam (ESE):	**35 Marks**

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2):	**10 & 10**	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against **15** Marks
	Assignment/Seminar +Attendance-	**05**	
	Total Marks -	**15**	
End Semester Exam (ESE):	**Laboratory / Field Skill Performance: On spot Assessment** **A. Performed the Task based on lab. work - 20 Marks** **B. Spotting based on tools& technology (written) – 10 Marks** **C. Viva-voce (based on principle/technology) - 05 Marks**		**Managed by Course teacher as per lab. status**

Name and Signature of Convener & Members of CBoS:

10/6/24