Course: BTech   **Semester:** 4

Prerequisite: Basic understanding of computer system

Rationale: This course provides detail of computer system's functional components, their characteristics, performance and interactions including system bus, different types of memory and input/output organization and CPU. This course also covers the architectural issues such as instruction set program and data types. On top that, the students are also introduced to the increasingly important area of parallel organization. This course also serves as a basic to develop hardware-related projects. And hence it is an important course for all students of computer engineering branch.

Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
Lecture Hrs/Week	Tutorial Hrs/Week	Lab Hrs/Week	Hrs/Week	Credit	Internal Marks			External Marks		
					T	CE	P	T	P	
3	0	0	0	3	20	20	-	60	-	100

SEE - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

W - Weightage (%) , T - Teaching hours

Sr.	Topics	W	T
1	**Introduction to Microprocessor 8085**Microprocessor, Instruction set and computer languages, 8085 Programming Model, Instruction Data Format and storage.	10	4
2	**Microprocessor architecture and interfacing**Microprocessor architecture and its operations, Memory and I/O devices, Memory interfacing, Interfacing I/O devices	20	8
3	**Programming methods with Instructions**8085 Instructions, Looping, Counting and Indexing, Logic operations Rotate and Compare	15	5
4	**Additional Programming techniques**Counter, time delay, Stack & Subroutines, Restart, Call and Return Instruction, Code conversion	15	8
5	**8085 Interrupts**Interrupt structure of 8085 microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts	10	4
6	**Computer Organization - Register Transfer and Basic Computer Design Register Transfer:**Register Transfer language, Bus design using multiplexer and Tri-state buffer, Memory Transfers, Arithmetic Micro- Operations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logical shift unit. **Basic Computer Design:** Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Register Reference Instructions, IO Reference Instructions, Interrupt, Design of Accumulator Unit.	15	8
7	**Computer Organization - Assembler and Memory Organization**Assembler: Machine Language, Assembly Language, Assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming. Memory Organization: Memory hierarchy, Main memory, Auxiliary memory, Flash memory, Associative memory, Cache memory, Virtual memory	15	8

Reference Books	
1.	**Microprocessor Architecture, Programming, and Applications with the 8085 (TextBook)** By Ramesh S. Gaonkar | Penram International.
2.	**Computer System Architecture** By M.Morris Mano | PHI | 3rd Edition
3.	**Microprocessor 8085 and its Interfacing** By Sunil Mathur | PHI Learning Pvt. Ltd
4.	**8085 Microprocessor And its Applications** By A. NagoorKani | TMH Education Pvt. Ltd

Course Outcome

After Learning the Course the students shall be able to:

After learning this course students will be able to:
1. Explain 808microprocessor architecture.
2. Design assembly language program for 808microprocessor.
3. Design Interfacing with various hardware with 808microprocessor.
4. Debug program written in assembly language.

Miscellaneous

Exam Requirement

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc

Course: BTech   **Semester:** 4

Prerequisite: Basic understanding of computer system

Rationale: This course provides detail of computer system's functional components, their characteristics, performance and interactions including system bus, different types of memory and input/output organization and CPU. This course also covers the architectural issues such as instruction set program and data types. On top that, the students are also introduced to the increasingly important area of parallel organization. This course also serves as a basic to develop hardware related projects. And hence it is an important course for all students of computer engineering branch.

Teaching and Examination Scheme											

Teaching Scheme					Examination Scheme					Total
					Internal Marks			External Marks		
Lecture Hrs/Week	Tutorial Hrs/Week	Lab Hrs/Week	Hrs/Week	Credit	T	CE	P	T	P	
0	0	2	0	1	-	-	20	-	30	50

SEE - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Outcome

After Learning the Course the students shall be able to:
After learning this course students will be able to: 1. Explain 808microprocessor architecture. 2. Design assembly language program for 808microprocessor. 3. Design Interfacing with various hardware with 808microprocessor. 4. Debug program written in assembly language.

List of Practical	
1.	**Addition of two 8 bit numbers using 8085**
	Addition of two 8 bit numbers using 8085
2.	**Write a program to add two 16 bit numbers.**
	Write a program to add two 16 bit numbers.
3.	**Part A: write an 8085 assembly language to perform multiplication of two 8 bit nos. Part B: write an 8085 assembly language to perform division of two 8 bit nos.**
	Part A: write an 8085 assembly language to perform multiplication of two 8 bit nos. Part B: write an 8085 assembly language to perform division of two 8 bit nos.
4.	**Write a program to add blocks of 8-bit data stored in memory locations.**
	Write a program to add blocks of 8-bit data stored in memory locations.
5.	**Write an 8085 assembly language program to find the minimum from two 8-bit numbers**
	Write an 8085 assembly language program to find the minimum from two 8-bit numbers
6.	**Part A. Write an assembly language program to sort data in ascending order. Part B Write an assembly language program to sort data in descending order.**
	Part A. Write an assembly language program to sort data in ascending order. Part B Write an assembly language program to sort data in descending order.
7.	**Write an 8085 assembly language program to get the minimum from block of n 8-bit number**
	Write an 8085 assembly language program to get the minimum from block of n 8-bit number
8.	**Write a program to convert BCD to binary.**
	Write a program to convert BCD to binary.
9.	**Write a program to convert binary to BCD**
	Write a program to convert binary to BCD
10.	**Write an 8085 assembly language program to convert a given binary number into its equivalent ASCII number**
	Write an 8085 assembly language program to convert a given binary number into its equivalent ASCII number
11.	**Write an 8085 assembly language program to convert a given ASCII number into its equivalent binary number**
	Write an 8085 assembly language program to convert a given ASCII number into its equivalent binary number

Miscellaneous

Exam Requirement

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.