NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	B.Tech. Computer Science and Engineering
Course Code:	2CSDE96
Course Title:	Interfacing with Microprocessors
Course Type:	Departmental Elective
Year of Introduction:	2021-22

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
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Course Learning Outcomes (CLO):

At the end of the course, students will be able to –

1. illustrate basic architecture of microprocessors
2. utilize microcontrollers for interfacing of industrial applications
3. develop logic for programs in assembly language
4. design microprocessor-based systems for interfacing peripherals

Syllabus: **Total Teaching hours: 30**

Unit	Syllabus	Teaching hours
Unit-I	**Microprocessor Architecture:** architectural details of 8085, 8086 and 80x86 processors, pin functions, read/write machine cycles, memory organization (linear, segmentation, paging), interrupts	08
Unit-II	**Microprocessor Programming:** instruction set of 8086 microprocessor, programming model, modular programming (procedures and macros), BIOS/DOS interrupts and programming of interrupt service routines.	09
Unit-III	**Interfacing:** Architecture and interfacing of Intel 8255 Programmable Peripheral Interface, Intel 8259 Programmable Interrupt Controller, Intel 8254 programmable timer, 8237 DMA Controller,	10
Unit-IV	Analog to Digital Converter and Digital to Analog Converter., Microcontrollers, interfacing and industrial applications in process control	03

Self-Study: The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents

Suggested Readings/ References:

1. Barry B. Brey, The Intel microprocessors, Prentice Hall publisher
2. Douglas V Hall, Microprocessors and Interfacing: Programming and Hardware, McGraw Hill publisher
3. Ramesh S. Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, Prentice Hall
4. John E. Uffenbeck, Microcomputers and Microprocessors: The 8080, 8085 and Z-80 Programming, Interfacing and Troubleshooting, Prentice Hall
5. Peter Abel, IBM PC Assembly language and programming, Pearson publisher

Suggested List of Experiments:

Sr.	Practical Title	Hours
1.	Write an assembly program to perform addition of two numbers. Run a sample assembly program and explore different options of debug commands.	02
2.	Perform binary arithmetic operations on two 16 bit numbers and two 32 bit numbers. Write a program using 'C' to perform inline assembly	02
3.	(a) Find maximum and minimum of numbers in an array. (b)Add ten numbers and find their average.	04
4.	Arrange numbers in ascending order.	02
5.	(a) String related interrupt handling: input, display string. (b) Find the number of 1's of given 8 bit number determine its parity and display the result.	04
6.	Reverse a string entered by the user using far procedure use stack for parameter passing.	02
7.	(a) Find the occurrences of a character from the entered string and display results using string related instructions. (b) Write a program to find sub string from a given string using near procedure. Take the string and the substring from the user.	04
8.	Generate the Fibonacci series using far procedure and display the series.	02
9.	Check whether the number is prime, odd or even using far procedures a) in same assembly module and b) in different assembly modules c) Implement copy command for copying one file to the other. Study of 8254 timer chip and its interfacing	04
10.	Design an ISR to handle divide overflow error.	02
11	Implement recursive procedure for finding factorial of a given number.	02

Suggested Case List: -NA-