Program :	**Diploma in Electronics Engineering**
Course Code : **5043C**	Course Title: **Advanced Microprocessors**
Semester : **5**	Credits: **4**
Course Category: **Program Elective**	
Periods per week: **4 (L:4, T:0, P:0)**	Periods per semester: **60**

Course Objectives:

- To provide an overview on the architecture and features of advanced Intel Microprocessors in general and Intel 8086 in detail.
- To introduce the technological features, architectures, processing techniques, and technological developments in the field of microprocessors.
- To introduce assembly language programming of 8086 microprocessor.

Course Prerequisites:

Topic	Course code	Course Title	Semester
Good knowledge of binary and hexadecimal number systems, binary arithmetic and BCD	3044	Digital Electronics	3
Knowledge of combinational logic circuits	3044	Digital Electronics	3

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Explain the architecture of Intel 8086 microprocessor	14	Understanding
CO2	Develop simple assembly language programs for 8086	18	Understanding
CO3	Explain the architectures of 80386 and Pentium	15	Understanding
CO4	Explain hyper threading and the architecture of multicore processors	11	Understanding

	Series Test	2	

CO-PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2						
CO2	3						
CO3	2						
CO4	2						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Explain the architecture of Intel 8086 microprocessor**		
M1.01	Describe the main features and internal architecture of Intel 8086	4	Understanding
M1.02	Explain memory segmentation and physical address generation in Intel 8086	3	Applying
M1.03	Illustrate the register set of Intel 8086	2	Understanding
M1.04	Explain the pin functions and minimum/maximum mode operations of Intel 8086	5	Understanding

Contents:

Features of Intel 8086 - Internal architecture of Intel 8086 - Memory segmentation - Physical address generation – simple problems - Register set of 8086 - Flag register –Pin diagram - Pin functions - Minimum mode and maximum mode configurations.

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO2	**Develop simple assembly language programs for 8086**		
M2.01	Explain interrupt processing in 8086	4	Understanding
M2.02	Interpret the addressing modes of 8086	3	Understanding
M2.03	Outline the instruction set of 8086	4	Understanding
M2.04	Outline the commonly used assembler directives (ASM 86)	3	Understanding

M2.05	Make use of the instruction set and assembler directives to develop simple assembly language programs for 8086	4	Applying
	Series Test I	1	

Contents:

Sources of interrupts in 8086 - interrupt response - interrupt vector table - types of interrupts - addressing mode - data addressing modes of 8086 - classification of 8086 instructions - instructions of 8086 (outline only) - assembler - assembler directives - commonly used assembler directives (ASM 86) - simple assembly language programs.

CO3	Explain the architectures of 80386 and Pentium		
M3.01	Explain the features, internal architecture and operating modes of Intel 80386	5	Understanding
M3.02	Illustrate address translation in PVAM	4	Understanding
M3.03	Explain the features and internal architecture of Intel Pentium	4	Understanding
M3.04	List the operating modes of Pentium	2	Remembering

Contents:

Key features of Intel 80386 - internal architecture of 80386 - operating modes - address translation in PVAM - segmentation and paging mechanisms - features of Pentium processor - internal architecture of Pentium processor – operating modes

CO4	Explain hyper threading and the architecture of multicore processors		
M4.01	Describe the concept of hyper threading technology	2	Understanding
M4.02	Identify the limitations of single core processor and the advantages of multicore processor	1	Understanding
M4.03	Explain the concept and major issues of multicore processing	3	Understanding
M4.04	Explain the internal architecture of Intel Core2 Duo	3	Understanding
M4.05	Outline the technological features of IA processors	2	Understanding
	Series Test II	1	

Contents:

Hyper threading technology - define core - limitations of single core processor - concept of

multi core processing - advantages - homogeneous and heterogeneous multicore processors - single core and multicore processors comparison - major issues in multicore processing - internal architecture of Intel Core2 Duo (Simple block diagram only) - important technological features of IA processors - comparison of Core i3, i5 and i7 processors.

Text /Reference:

T/R	BookTitle/Author
T1	Douglas V Hall - Microprocessors and Interfacing - TMH
R1	Lyla B Das - The x86 Microprocessors - Second Edition - Pearson
R2	Yu Cheng Liu and Glen A Gibson - Microcomputer Systems: The 8086/8088 Family – PHI
R3	A NagoorKani - Microprocessor 8086 Programming & Interfacing - RBA Publications.

Online resources:

Sl. No	Website Link
1	https://www.tutorialspoint.com/microprocessor/index.htm
2	https://www.javatpoint.com/8086-microprocessor
3	https://vardhaman.org/wp-content/uploads/2021/03/Unit-1-MPMC.pdf
4	https://electronicsdesk.com/80386-microprocessor.html
5	https://electronicsdesk.com/pentium-microprocessor.html
6	https://www.intel.in/content/www/in/en/gaming/resources/hyper-threading.html
7	https://www.techtarget.com/searchdatacenter/definition/multi-core-processor
8	https://www.javatpoint.com/what-is-a-multicore-processor