

III B.Tech – II Semester
(20EC6011) MICROPROCESSORS AND MICROCONTROLLERS

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	-	-	3

Pre-Requisites: Digital Electronics

Course Objectives:

- To acquire knowledge on microprocessors architecture and modes of operation of 8086 and their timing diagrams.
- To develop programs by learning different addressing modes and programming of 8086
- To acquire the knowledge on interfacing with memory and various other peripherals
- To study the features of 8051 microcontroller, its architecture, addressing modes and instruction set.
- To learn concepts of ARM architectures and processors

UNIT-I:

8086 Architecture: Main features, register organization of 8086, pin diagram/description, internal architecture, bus interfacing unit, execution unit, interrupts and interrupt response, 8086 system timing, minimum mode and maximum mode configuration.

UNIT-II:

8086 Programming: Program development steps, instruction set of 8086, addressing modes, assembler directives, writing simple programs with an assembler.

UNIT-III:

Semiconductor memories interfacing (RAM, ROM), programmable communication interface 8251 USART, 8254 software programmable timer/counter, PIO 8255, modes of operation of 8255, stepper motor interfacing, Programmable interrupt controller 8259A, the keyboard/display controller 8279.

UNIT-IV:

Intel 8051 MICROCONTROLLER: Introduction, 8051 architecture, 8051 pin description, I/O ports and circuits, memory organization, counters/timers, serial data input/output, interrupts. Assembly language programming: Instructions, addressing modes, simple programs.

UNIT-V:

ARM Architectures and Processors: ARM Architecture, ARM Processors Families, ARM Cortex-M Series Family, ARM Cortex-M3 Processor Functional Description, functions and interfaces.

Course Outcomes:

After successful completion of the course, the students can be able to

S. No	Course Outcome	BTL
1.	Understand the architecture of microprocessor/ microcontroller and their operation.	L2
2.	Demonstrate programming skills in assembly language for processors.	L3
3.	Analyze various interfacing techniques and apply them for the design of processor based systems.	L3
4.	Design simple applications by using microcontrollers.	L4
5.	Understand various ARM architectures and processors.	L2

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	1	2	-	-	-	-	-	-	-	-	-	2	-
CO 2	1	2	2	-	-	-	-	-	-	-	-	-	2	-
CO 3	1	2	2	-	-	-	-	-	-	-	-	-	2	-
CO 4	2	3	3	2	-	-	-	-	-	-	-	-	3	-
CO 5	2	3	3	3	-	-	-	-	-	-	-	-	3	-

Text Books:

1. A.K.Ray, K.M.Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.
2. The 8051 Microcontroller & Embedded Systems Using Assembly and C by Kenneth J.Ayala, Dhananjay V.Gadre, Cengage Learning , India Edition.
3. Ajay V Deshmukh, "Microcontrollers", TATA McGraw Hill publications, 2012.

Reference Books:

1. Microprocessors and Interfacing – Programming and Hard ware by Douglas V Hall, SSSP Rao, Tata McGraw Hill Education Private Limited, 3rd Edition.
2. Microprocessors and Microcontrollers by N.Senthil Kumar, M.Saravanan and S.Jeevananthan, Oxford University Press, Seventh Impression 2013.
3. Microprocessors and Microcontrollers-Architecture, Programming and System Design by Krishna Kant, PHI Learning Private Limited, Second Edition, 2014.