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Microprocessor and Its Applications — Complete Syllabus

BTEUP Diploma in Electronics Engineering • 4th Semester • Session 2026-27
Subject 4.1 (Theory) + 4.5 (Lab) • Total 200 Marks • 6 Credits

About this document: Microprocessor and Its Applications appears twice in the 4th semester — as a theory paper (4.1) and as a lab (4.5). Both are covered here, completely, in the official order.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.1	Microprocessor and Its Applications	Theory	3 - 0	3	Theory 40	Theory 60 (3 hrs)	100
4.5	Microprocessor and Its Applications (Lab)	Practical	0 - 6	3	Practical 60	Practical 40 (3 hrs)	100
Microprocessor and Its Applications Total				6	100	100	200

What This Subject Aims To Do

To give a strong foundation in microprocessor concepts and evolution, with emphasis on the 8085 and 8086 architectures — instruction sets, assembly language programming, memory organisation and peripheral interfacing — plus practical programming skills and real-world applications of microprocessor-based systems.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction to Microprocessor	10	24%
2	8086 Microprocessor Programming	12	29%
3	Interfacing with Peripheral Devices	8	19%
4	Microprocessor-Based System Design	6	14%
5	Microcontrollers and Embedded Systems	6	14%

Unit 1 — Introduction to Microprocessor (10 Periods, 24%)

Topics: Evolution and History of microprocessors, Introduction to 8-bit, 16-bit, and 32-bit processors, Architecture and Operation of the 8085 microprocessor, Addressing modes and Bus organization, Architecture and Operation of the 8086 microprocessor, Addressing modes and Bus organization

In simple words: How microprocessors evolved, and the inside story of the 8085 and 8086: their architecture, addressing modes and buses.

Unit 2 — 8086 Microprocessor Programming (12 Periods, 29%)

Topics: Instruction set of 8086 microprocessors, Assembly language programming, Stack, Subroutines and Interrupt Handling

In simple words: Writing programs in assembly language for the 8086: its instructions, the stack, subroutines and interrupts.

Unit 3 — Interfacing with Peripheral Devices (8 Periods, 19%)

Topics: Memory and I/O interfacing, 8255 Programmable Peripheral Interface, DC, DAC, and sensor interfacing, Serial and parallel communication

In simple words: Connecting a microprocessor to the outside world: memory, I/O ports, the 8255 interface chip, ADC/DAC and sensors, and serial/parallel communication.

Unit 4 — Microprocessor-Based System Design (6 Periods, 14%)

Topics: Design of microprocessor-based control systems, Industrial applications of microprocessors, Data acquisition and process control, Case studies of real-world applications

In simple words: Designing complete control systems around a microprocessor, with industrial examples and case studies.

Unit 5 — Microcontrollers and Embedded Systems (6 Periods, 14%)

Topics: Introduction to Microcontrollers (8051), Difference between microprocessors and microcontrollers, Role of microcontrollers in embedded systems, Applications of modern microprocessor-based systems

In simple words: Microcontrollers vs microprocessors, the 8051, and where embedded systems fit in modern products.

Practical Work

- Introduction to 8085/8086 kit and instruction set.
- Add two 8-bit numbers using 8085.
- Subtract and compare two 8-bit numbers.
- Multiply two 8-bit numbers using repeated addition.
- Divide two 8-bit numbers using 8085.
- Block data transfer using 8085.
- Sorting of an array using 8085.
- To add two hexadecimal & decimal numbers using 8085.
- To subtract two hexadecimal & decimal numbers using 8085.
- Interfacing ADC/DAC with 8085.
- To interface ADC & DAC with 8085 & demonstrate generation of square wave.
- Add two 8-bit numbers using 8086.
- Subtract and compare two 8-bit numbers using 8086.
- Multiply two 8-bit numbers using repeated addition using 8086.
- Divide two 8-bit numbers using 8086.
- Block data transfer using 8086.
- Sorting of an array using 8086.
- Perform various logical operation using 8086.
- Perform universal gate operation using 8086.
- Find 1s' and 2's complement of a number in 8086.
- Program for LED blinking using microprocessor I/O interfacing.

- Stepper motor interfacing using 8255.
- Traffic light control simulation using 8085.

Reference Books (as listed in the syllabus)

- Ramesh Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, PHI.
- Douglas V. Hall, Microprocessors and Interfacing: Programming & Hardware, McGraw-Hill.
- Kenneth J. Ayala, The 8051 Microcontroller, Cengage Learning.
- B.B. Dwivedi, Microprocessors & Peripheral Devices, Asian Publishers, Muzaffarnagar. ISBN: 978-93-91541-77-4
- A.P. Godse & D.A. Godse, Microprocessor and its Applications, Technical Publications.
- Muhammad Ali Mazidi, The 8051 Microcontroller and Embedded Systems, Pearson.

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Source: BTEUP 2nd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.
Please confirm with your own polytechnic for any local changes.

