

# Bangladesh Polytechnic Institute

Technology: **Electrical**

Semester: 6<sup>th</sup>

Sub. Name: Digital Electronics & Microprocessors. (6866)

T P C: 3 3 4

## Course Outline

Teacher Name: Asadullah-Al-Galib

Mob.No: 01817 58 38 99

Class No.	Discussion and Explanation of Topics/ Titles	Remarks
Class-1	<ul style="list-style-type: none"> <li>❖ <b>Understand Number systems and codes.</b> <ul style="list-style-type: none"> <li>➤ Describe binary, octal and Hexadecimal Number systems.</li> <li>➤ Convert one number system to another.</li> <li>➤ Compute binary, Octal and hexadecimal arithmetic.</li> <li>➤ Describe BCD Code, Excess- 3 Code, Gray Code, Alphanumeric Codes.</li> <li>➤ Convert one type of code to another.</li> <li>➤ Describe the method of error detection and correction by using Parity bit.</li> <li>➤ Describe the function of Hamming code.</li> <li>➤ Describe the applications of codes.</li> </ul> </li> </ul>	
Class-2	<ul style="list-style-type: none"> <li>❖ <b>Understand the basic digital circuits.</b> <ul style="list-style-type: none"> <li>➤ Describe the digital signals.</li> <li>➤ State the main reasons for the widespread use of digital systems.</li> <li>➤ Describe AND, OR, NOT, NAND, NOR and XOR operations.</li> <li>➤ Describe the realization of basic logic operations using NAND and NOR gates.</li> </ul> </li> </ul>	
Class-3	<ul style="list-style-type: none"> <li>➤ Describe the boolean algebraic theorems.</li> <li>➤ Simplify the logic expressions by using boolean algebra.</li> <li>➤ Simplify the logic expressions by using Karnaugh map (upto 4 Variables).</li> <li>➤ Describe the characteristics of digital ICs.</li> <li>➤ Describe different types of digital logic families.</li> </ul>	
Class-4	<ul style="list-style-type: none"> <li>❖ <b>Understand Combinational Logic circuits.</b> <ul style="list-style-type: none"> <li>➤ Describe the operation of a digital multiplexer and demultiplexer.</li> <li>➤ Describe the operation of half adder and full adder.</li> <li>➤ Describe the operation of half subtractor and full subtractor.</li> </ul> </li> </ul>	
Class-5	<ul style="list-style-type: none"> <li>➤ Explain the function of arithmetic logic unit (ALU) with block diagram.</li> <li>➤ Describe the operation of digital comparators.</li> <li>➤ Describe the function of parity generator/checkers.</li> <li>➤ Describe the function of priority encoders and BCD-to-7 segment decoder with block diagram.</li> </ul>	
Class-6	<ul style="list-style-type: none"> <li>• <b>Feedback</b></li> </ul>	
Class-7	<ul style="list-style-type: none"> <li>• <b>Feedback</b></li> </ul>	
Class-8	<ul style="list-style-type: none"> <li>❖ <b>Understand the concept of Flip-Flops and shift registers.</b> <ul style="list-style-type: none"> <li>➤ Describe the operation of a sequential circuit with block diagram.</li> <li>➤ Describe the working principle of clocked S-R flip-flop, J-K flip-flop, Master-slave flip-flop, D-type flip-flop and T-type flip-flop.</li> <li>➤ State the applications of flip-flops. registers.</li> </ul> </li> </ul>	
Class-9	<ul style="list-style-type: none"> <li>➤ Discuss the function of registers.</li> <li>➤ Describe the operation of shift registers.</li> <li>➤ Mention the applications of shift registers.</li> </ul>	

# Bangladesh Polytechnic Institute

Technology: **Electrical**

Semester: 6<sup>th</sup>

Sub. Name: Digital Electronics & Microprocessors. (6866)

T P C: 3 3 4

## Course Outline

Teacher Name: Asadullah-Al-Galib

Mob.No: 01817 58 38 99

	➤ List some common ICs used as flip-flops and shift	
Class-10	<b>❖ Understand the features of Counters.</b> <ul style="list-style-type: none"> <li>➤ Describe the operation of ripple or asynchronous counters.</li> <li>➤ Describe the principle of UP/DOWN counters.</li> <li>➤ Describe the modulus of the Counter.</li> <li>➤ Describe the operation of synchronous counters</li> </ul>	
Class-11	<ul style="list-style-type: none"> <li>➤ Explain the function of combination counter.</li> <li>➤ Discuss the principle of ring counter and Johnson counters.</li> <li>➤ List some common ICs used as a counter with block diagram.</li> </ul>	
Class-12	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	
Class-13	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	
Class-14	<b>❖ Understand the principles of A/D and D/A Converters.</b> <ul style="list-style-type: none"> <li>➤ Discuss the general principles of D/A and A/D conversion.</li> <li>➤ Describe the operation of weighted-resistor D/A converter.</li> <li>➤ Describe the operation of R-2R ladder D/A converter.</li> <li>➤ Explain the characteristics of D/A converter.</li> <li>➤ Describe the operation of sample and hold Circuits.</li> <li>➤ Describe the operation of parallel comparator A/D converter.</li> </ul>	
Class-15	<ul style="list-style-type: none"> <li>➤ Describe the operation of successive-approximation A/D converter.</li> <li>➤ Describe the operation of dual-slope A/D converter.</li> <li>➤ Describe the use of A/D converter as voltage-to-frequency and voltage-to-time converters.</li> <li>➤ List some popular ICs used as A/D and D/A converters.</li> </ul>	
Class-16	<b>❖ Understand the features of Semiconductor Memories.</b> <ul style="list-style-type: none"> <li>➤ Describe the operation of a memory device with block diagram.</li> <li>➤ Describe the concept of READ and WRITE operation of memories.</li> <li>➤ Mention the classification of memories.</li> <li>➤ Mention the characteristics of memories.</li> </ul>	
Class-17	<ul style="list-style-type: none"> <li>➤ Discuss the principle of sequential memory.</li> <li>➤ Discuss the principles of ROM, PROM, EPROM, EEPROM and Flash memory.</li> <li>➤ Mention the principle of static and dynamic RAM.</li> <li>➤ Identify some commercial memory ICs.</li> </ul>	
Class-18	<b>MICROPROCESSORS</b>	
Class-19	<b>❖ Understand the features of Simple Microprocessors (8-bit)</b> <ul style="list-style-type: none"> <li>➤ Describe the block diagram of a digital Computer.</li> <li>➤ Define Microprocessor..</li> <li>➤ Describe the architecture of 8085 microprocessor.</li> </ul>	
Class-20	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	

# Bangladesh Polytechnic Institute

Technology: **Electrical**

Semester: 6<sup>th</sup>

Sub. Name: Digital Electronics & Microprocessors. (6866)

T P C: 3 3 4

## Course Outline

Teacher Name: Asadullah-Al-Galib

Mob.No: 01817 58 38 99

Class-21	<ul style="list-style-type: none"> <li>• <b><u>Class test-1</u></b></li> </ul>	
Class-22	<ul style="list-style-type: none"> <li>• <b><u>Mid Term Exam</u></b></li> </ul>	
Class-23	<ul style="list-style-type: none"> <li>➤ Describe the pin diagram and function of each pin of Intel 8085 microprocessors.</li> <li>➤ Describe the registers of Intel 8085 microprocessors.</li> <li>➤ Differentiate between microcontrollers and microprocessors.</li> </ul>	
Class-24	<ul style="list-style-type: none"> <li>❖ <b>Understand the Programming of 8085 Microprocessors.</b></li> <li>➤ Describe the instruction set of 8085 microprocessors.</li> <li>➤ Explain the addressing modes of the Intel 8085 microprocessors.</li> <li>➤ Mention the simple programs using the 8085 instructions.</li> </ul>	
Class-25	<ul style="list-style-type: none"> <li>➤ Discuss the function of programmable peripheral Interface (PPI), programmable DMA controller and programmable interrupt controller (PIC).</li> <li>➤ Discuss the function of Programmable Interval Timer and Programmable Communication Interface.</li> <li>➤ List 8-bit, 16-bit, 32 bit and 64-bit Microprocessors.</li> </ul>	
Class-26	<ul style="list-style-type: none"> <li>❖ <b>Understand the 8085 microprocessor system.</b></li> <li>➤ Draw a 8085 based computer.</li> <li>➤ Explain the process of demultiplexing AD<sub>7</sub> -AD<sub>0</sub> bus using latch.</li> <li>➤ Describe the technique of generate control signals.</li> </ul>	
Class-27	<ul style="list-style-type: none"> <li>➤ Mention the function of interrupt controls and serial I/O controls.</li> <li>➤ Differentiate between memory mapped I/O and standard I/O.</li> </ul>	
Class-28	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	
Class-29	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	
Class-30	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	
Class-31	<ul style="list-style-type: none"> <li>• <b><u>Feedback</u></b></li> </ul>	
Class-32	<ul style="list-style-type: none"> <li>• <b><u>Class test-2</u></b></li> </ul>	