Daffodil Institute of Engineering & Technology, Institute Code: 50243
Lesson Plan – Academic session: Feb/26- Aug/26

Subject Teacher	: MD.Badeuzzamal Sarker (Instructor)
Subject Name	: Digital Electronics – 1
Subject Code	: 26831
Technology	: Computer Science & Technology
Semester	: 3rd
Reference Book	: Digital Electronics -1 (Reference Book : Haque Publication)

Mark Distribution (for 150 Marks)			
Theory Marks		**Practical Marks**	
Midterm	10	PC	25
Class test	10	PF	25
Quiz and presentation	10	-	-
Final	120	-	-
Total	**150**	**Total**	**50**

Marks	Grade Point	Letter Grade	*Marks*	Grade Point	Letter Grade
80>	4.00	A+	55-59	2.75	B-
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

Class Timing Distribution	
Particulars	Time
Greeting with students	2 Min
Previous Class Review	4 Min
Present Class Topic and Lecture Delivery	40 Min
Present Class Topics Review	4 Min

Objective

Diploma in Engineering Level students are required to acquire the knowledge and skill on concept of number system. logic gates, Boolean algebra, combinational logic circuits, Simplification of logic circuits and Sequential circuits which are used in most of digital system and the foundation of Microcontroller and Microcontroller.

After completing the subject, students will be able to:

- Explain and apply the fundamental concepts of digital electronics, including number systems, codes, conversions, and binary arithmetic
- Analyze, verify, and implement logic gates, logic families, and logic circuit simplification techniques
- Design, test, and explain combinational logic circuits such as adders, subtractors, encoders, decoders, multiplexers, and demultiplexers
- Implement various digital circuits using NAND and NOR gates as universal gates
- Explain the operation of sequential logic circuits and flip-flops (SR, D, etc.) and verify their truth tables
- Design and test code converters and display digital outputs using 7-segment display

Lecture Plan :

Lecture	Chapter	Topics	Outcomes	Supporting Equipment
01	Understand basic concept of digital electronics.	1.1 Define digital electronics & Digital Signal. 1.2 Mention the characteristics of digital signal. 1.3 Describe the advantages of working in digital mode. 1.4 Define logic level of digital signal.	To know about digital electronics & digital signal.	

		1.5 Identify DC voltage level of digital signal. 1.6 Describe parameters of a digital pulse waveform such as rise time, fall time, pulse width and duty cycle.		
02-03	Understand the number system and binary arithmetic operation.	2.1 Define & Describe decimal, binary, octal and hexadecimal number system. 2.2 Convert one number system to another. 2.3 Compute binary arithmetic & . Complement subtraction Technique. 2.4 State the applications of different number system.	To know about numbering system in electronics.	
04	**Quiz - 01**	**Chapter 1-2**		
05	Understand the arithmetic codes and code conversion.	3.1 Define 8421, Excess—3code, Gray code, BCD code, Hamming code, Unicode, and ASCII code. 3.2 Describe 8421, Excess—3code, Gray code, BCD code, Hamming code, Unicode, and ASCII code. 3.3 Practice the conversion of one code to another. 3.4 Describe the addition and subtraction of 8421, Excess-3 and BCD coded number. 3.5 State parity checked code and Hamming code. 3.6 Describe the error detection and correction with Hamming code. And parity checked code.	To know about any type of code conversion.	
06	**Class Test – 01**	**Chapter 1-3**		
07	Understand the concept of Logic gates.	4.1 Define logic gate. 4.2 Classify logic gate. 4.3 Explain logical statement, truth table, Boolean equation and symbol of AND, OR, NOT, NOR, NAND, EX-OR and EX-NOR gates. 4.5 NAND & NOR gates used as Universal logic gates. 4.6 State the applications of logic gates.	To know about logic different kinds of logic gates.	
08	**Quiz-02**	**Chapter 3-4**		

09	Understand the features of the logic families and digital IC's.	5.1 Classify logic families. 5.2 Define SSI, MSI, LST and VLSI. 5.3 Describe Transistor logic families (DTL & TTL). 5.4 Describe MOS logic families (P-MOS, N-MOS & C-MOS) 5.5 State the meaning of the terms propagation delay time, speed, noise immunity, power dissipation, fan-in, fan-out, operating temperature and power rating of logic circuits. 5.6 State the characteristics of digital IC's.	To know about logic family.	
10	Understand the concepts of electronic circuit of logic gates.	6.1 Describe the operation of standard TTL NAND gate. 6.2 Describe the operation of CMOS NAND & NOR gates. 6.3 State special logic gates such as buffer, tri-state and expandable gates. 6.4 Mention the basic principle of ORing and ANDing.		To know about logic gates operation.
11	**Class Test - 02**	**Chapter 4-6**		
12	**Review Class**	**Chapter 1-3**		
13	**Review Class**	**Chapter 4-6**		
Midterm Examination				
14-15	Understand digital IC's	7.1 Define Digital IC's 7.2 Describe fixed function Integrated circuit IC's such as AND, OR, NAND etc. 7.3.Mention IC package, code numbers, and important specification of TTL/MOS commercial IC gates. 7.4 Mention the applications of different logic IC's.	To know about digital IC's.	
16-17	Understand logic simplification & design of digital circuit.	8.1 State the theorems of Boolean algebra. 8.2 State DeMorgan's theorems and its applications. 8.3 Determine the terms-Sum of Product (SOP) form and Product of Sum (POS) form. 8.4 Determine the SOP & POS form from truth table. 8.5 Define Kamaugh Map.	To know about different kinds of theorems.	

		8.6 State the structure of Karnaugh map. 8.7 State the simplification process of Boolean expression from a K-map and design logic circuit (up to 4 variables).		
18	**Quiz Test**	**Chapter 7-8**		
19-20	Understand various combinational logic circuits.	9.1 Define combinational logic circuit with example. 9.2 Describe the operation of half adder and half Sub tractor. 9.3 Explain the operation of full adder and full Sub tractor. 9.4 Describe the operation of 4 bit parallel adder. 9.5 Explain the operation of 4 bit subtraction circuit. 9.6 Describe the operation of parity generator and detector circuit. 9.7 Describe the operation of 4 bit BCD adder. 9.8 Explain the operation of multipliers & divisors. 9.9 Mention the application of combinational logic circuit.	To know about logic circuit by using logic gates.	
21	**Class Test - 03**	**Chapter 7-9**		
22-23	Understand the concepts of encoder, decoder and display devices.	10.1 Describe the operation of encoder and decoder circuit. 10.2 State the principle of operation of LCD, LED, seven-segment and dot matrix display. 10.3 Explain the operation of commonly used 4-bit BCD decoder/driver for seven segment display of common Anode/Cathode type. 10.4 Describe the operation of parity generator & detector circuits	To know about operation of different kinds of circuit.	
24-25	Understand the features of multiplexers and demultiplexer.	11.1 Define multiplexers and demultiplexer. 11.2 Describe the operation of 2:1, 4:1 and 8:1 multiplexer with logic diagram. 11.3 Describe the operation of 1:2, 1:4 and 1:8 demultiplexers with logic diagram. 11.4 State the use of multiplexer &demultiplexer. 11.5 Explain the operation of Binary comparator.	To know about different kind of combinational circuit.	

		11.6 Describe the Pin diagram of commonly used 4-bit comparator ICs. 11.7 Distinguish between Decoder and Demultiplexer.		
26	**Quiz Test**	**Chapter 10-11**		
27-28	Understand the features of sequential logic circuits.	12.1 Define sequential logic circuit State the terms clock, timing diagram & latch of digital system. 12.2 Explain the operation of basic SR latch, D flip-flop, clocked flip-flop, J-K flip-flop, 12.3 Toggle operation & J-K master-slave flip-flop. 12.4 State the concept of positive & negative edge triggering and level triggering, 12.5 Describe the pin diagram of commonly used flip-flop IC's.	To know about sequential logic circuit.	
29	**Class test – 04**	**Chapter 10-12**		
30	**Review Class**	**Chapter 1-4**		
31	**Review Class**	**Chapter 5-8**		
32	**Review Class**	**Chapter 9-12**		
Final Term Exam				