

**Daffodil Institute of IT**

**Department of Computer Technology**

# **Semester Plan**

**Course Title:** Analog Electronics

**Course Code:** 66823

**Semester:** 2nd

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**Course Teacher:**

Hasan Murad Munna

Jr. Instructor, Dept. of Electrical Technology

Daffodil Institute Of IT

Cell: 01858276841

E-mail: hasan.munna@diit.info

**Course Structure:**

Class. No	Subject Code	Name of the subject	T	P	C	MARKS				
						Theory		Practical		TOTAL
						TC	TF	PC	PF	
1	66823	Analog Electronics	3	3	4	60	90	25	25	200

**Theory plan:**

<b>Class No</b>	<b>Chapter</b>	<b>Description</b>
<b>01</b>	<b>01</b>	<b>1. Understand the Electronics, its components and measuring and testing equipment.</b> 1.1 Define electronics. 1.2 Describe the scope of electronics. 1.3 Describe the active and passive components used in electronic circuits.
<b>02</b>	<b>01</b>	1.4 Define resistor, inductor and capacitor and mention the function of those in electronic circuits. 1.5 Describe the procedure of determining the value of resistor, inductor and capacitor using numeric and color code.
<b>03</b>	<b>01</b>	1.6 Describe the function of (i) Ammeter, (ii) Voltmeter, (iii) AVO meter, (iv) Function Generator, (v) Logic Probe, (vi)
		Semiconductor Device Tester and (vii) Oscilloscope.
<b>04</b>	<b>02</b>	<b>2. Understand the Concept of Semiconductor used in Electronics.</b> 2.1 Define Semiconductor. 2.2 Describe covalent bond and the effect of temperature on Semiconductor. 2.3 Explain the energy band diagram of conductor, semiconductor and insulator. 2.4 Explain the characteristics of carbon, silicon, germanium and gallium arsenide.

05	02	<p><b>2. Understand the Concept of Semiconductor used in Electronics.</b></p> <p>2.5 Describe the classification of Semiconductor.</p> <p>2.6 Describe the generation &amp; recombination of hole and electron during doping in extrinsic semiconductor.</p> <p>2.7 Describe the formation of P-type &amp; N-Type semiconductor material.</p> <p>2.8 Explain the majority &amp; minority charge carriers of P-type &amp; N-Type Semiconductor.</p>
06	03	<p><b>3. Understand the Concept of P-N Junction Diode</b></p> <p>3.1 Define PN junction diode</p> <p>3.2 Describe the formation of depletion layer in PN junction.</p> <p>3.3 Discuss potential barrier, drift &amp; diffusion current and their physical significance.</p>
07	03	<p><b>3. Understand the Concept of P-N Junction Diode</b></p> <p>3.4 Explain forward and reverse bias in PN junction with barrier voltage</p> <p>3.5 Mention the behavior of PN junction under forward and reverse bias.</p> <p>3.6 Explain the forward and reverse Voltage-Current (VI) characteristics curve of PN junction diode.</p>
08	03	<p><b>3. Understand the Concept of P-N Junction Diode</b></p> <p>3.7 Define (i) static resistance, (ii) dynamic resistance, (iii) forward breakdown voltage, (iv) peak inverse voltage (PIV) and (v) reverse break down voltage.</p> <p>3.8 Describe the specification of PN Junction diode.</p>
09	04	<p><b>4. Understand the DC power supply.</b></p> <p>4.1 Define dc power supply and describe its importance in electronics.</p> <p>4.2 Define regulated and unregulated power supply.</p> <p>4.3 Describe the operation of a typical regulated dc power supply with block diagram.</p>

10	04	<p>4.4 Define rectifier and rectification.</p> <p>4.5 Explain the operation of half wave, full wave and bridge rectifier circuit.</p>
11	04	<p>4.6 Determine the ripple factor, efficiency and TUF of half wave, full wave and bridge rectifier.</p> <p>4.7 Define filter circuit and explain the operation of capacitor, inductor capacitor and pi (<math>\pi</math>) filter circuit.</p>
12	05	<p><b>5. Understand the Concepts of Special diode.</b></p> <p>5.1 Define Zener Diode.</p> <p>5.2 Describe the operation of Zener diode.</p> <p>5.3 Explain VI characteristics of Zener diode.</p>
13	05	<p>5.4 Explain Zener diode as a auto-variable resistor.</p> <p>5.5 Describe the application of Zener diode in (i) voltage stabilization, (ii) meter protection and (iii) peck clipper circuits.</p>

14	05	<p>5.6 Describe the construction, operation and application of (i) Tunnel diode, (ii) Varactor diode, (iii) Schottky diode, (iv) Step-Recovery diode, (v) PIN diode, (vi) LED, (vii) LCD, (viii) photo diode and (ix) Solar cell.</p>
15	06	<p><b>6. Understand the construction and operation of Bipolar Junction Transistor (BJT)</b></p> <p>6.1 Define Transistor.</p> <p>6.2 Describe the construction of PNP and NPN Transistor.</p> <p>6.3 State the biasing rules of BJT.</p>
16	06	<p>6.4 Explain the mechanism of current flow of PNP and NPN Transistor.</p> <p>6.5 Establish the relation among Base, Emitter and Collector current (<math>I_E = I_C + I_B</math>).</p> <p>6.6 Draw the three basic transistor configuration (CB, CC, CE) circuits.</p>

<b>17</b>	<b>06</b>	6.7 Describe current amplification factor $\alpha$ , $\beta$ and $\beta$ . 6.8 Establish the relation among $\alpha$ , $\beta$ and $\beta$ . 6.9 Solve problem related to $I_E$ , $I_C$ , $I_B$ , $\alpha$ , $\beta$ and $\beta$
<b>18</b>	<b>07</b>	7. Understand the concept of BJT Amplifier 7.1 Define (i) amplifier, (ii) amplification and (iii) gain. 7.2 Mention the classification of amplifier.

<b>19</b>	<b>07</b>	7.3 Describe the principle of operation of a common emitter (ce) amplifier. 7.4 Draw DC & AC equivalent circuits of the CE amplifier circuit.
<b>20</b>	<b>07</b>	7.5 Mention the formula of (i) input resistance, (ii) output resistance, (iii) current gain, (iv) voltage gain and (v) power gain. 7.6 Solve problem related to different gain and resistance.
<b>21</b>	<b>08</b>	<b>8. Understand the main feature of digital electronics</b> 8.1 Describe the difference between analog and digital system. 8.2 State the advantage of digital system over analog system.

<b>22</b>	<b>08</b>	8.3 Define logic gate. 8.4 Describe the basic logic gates and their functions (AND gate, OR gate and NOT circuit or INVERTER).
<b>23</b>	<b>08</b>	8.5 Describe the NAND, NOR, XOR & XNOR logic gates and their functions. 8.6 Define Truth table and Prepare truth table to describe the functions of AND, OR, NOT, NAND, NOR, XOR and XNOR logic gates.