

**GOVERNMENT POLYTECHNIC, SAMBALPUR, RENGALI**

**DEPARTMENT OF E&TC ENGINEERING**

**LESSON PLAN(SUMMER-2022)**

**SUBJECT- ANALOG ELECTRONICS & OPERATIONAL AMPLIFIER(TH-2)  
SEMESTER-4<sup>TH</sup> ELECTRICAL ENGINEERING**

**NAME OF THE FACULTY- Ms. SADHANA SUBHALAXMI**

**TOTAL NO. OF PERIODS-60(4P/WEEK)**

<b>UNIT</b>	<b>DATE</b>	<b>PERIOD</b>	<b>TOPICS TO BE COVERED</b>
<b>1</b>	3 <sup>rd</sup> week of March,2022		<b>P-N JUNCTION DIODE</b>
		1	P-N Junction Diode, Working of Diode, V-I characteristic of PN junction Diode.
		2	DC load line, Important terms such as Ideal Diode, Knee voltage
		3	Junctions break down. ->Zener breakdown -> Avalanche breakdown
		4	P-N Diode clipping Circuit.
		5	P-N Diode clamping Circuit
		6	Previous year questions, numericals & assignment discussion
<b>2</b>	1 <sup>st</sup> week of April,2022		<b>SPECIAL SEMICONDUCTOR DEVICES</b>
		1	Thermistors, Sensors & barretters
		2	Zener Diode
		3	Tunnel Diode
		4	PIN Diode
		5	Previous year questions, numericals & assignment discussion
<b>3</b>	2 <sup>nd</sup> week of April,2022		<b>RECTIFIER CIRCUITS &amp; FILTERS</b>
		1	Classification of rectifiers, Analysis of half wave, full wave centre tapped and Bridge rectifiers
		2	Calculate: ->DC output current and voltage ->RMS output current and voltage
		3	->Rectifier efficiency -> Ripple factor -> Regulation
		4	->Transformer utilization factor -> Peak inverse voltage
		5	Filters:
		6	-> Shunt capacitor filter -> Choke input filter -> $\pi$ filter

		7	Previous year questions, numericals & assignment discussion
4	4 <sup>th</sup> week of April,2022		<b>TRANSISTORS</b>
		1	Principle of Bipolar junction transistor, Different modes of operation of transistor
		2	Current components in a transistor
		3	Transistor as an amplifier
		4	Transistor circuit configuration & its characteristics -> CB Configuration
		5	-> CE Configuration
		6	-> CC Configuration
		7	Previous year questions, numericals & assignment discussion
5	2 <sup>nd</sup> week of May,2022		<b>TRANSISTOR CIRCUITS</b>
		1	Transistor biasing
		2	Stabilization, Stability factor
		3	Different method of Transistors Biasing ->Base resistor method
		4	->Collector to base bias
		5	->Self bias or voltage divider method
		6	Revision Test
		7	Previous year questions, numericals & assignment discussion
6	4 <sup>th</sup> week of May,2022		<b>TRANSISTOR AMPLIFIERS &amp; OSCILLATORS</b>
		1	Practical circuit of transistor amplifier -> DC load line and DC equivalent circuit -> AC load line and AC equivalent circuit
		2	Calculation of gain, Phase reversal, H-parameters of transistors
		3	Simplified H-parameters of transistors, Generalised approximate model, Analysis of CB, CE, CC amplifier using generalised approximate model
		4	Multi stage transistor amplifier ->R.C. coupled amplifier ->Transformer coupled amplifier
		5	Feedback in amplifier, General theory of feedback, Negative feedback circuit
		6	Advantage of negative feedback Power amplifier and its classification, Difference between voltage amplifier and power amplifier
		7	Transformer coupled class A power amplifier
		8	Class A push – pull amplifier
		9	Class B push – pull amplifier

			Oscillators
		10	Types of oscillators, Essentials of transistor oscillator
		11	Principle of operation of tuned collector, Hartley, colpitt oscillator (no mathematical derivation)
		12	Principle of operation of phase shift, wein-bridge oscillator (no mathematical derivation)
		13	Previous year questions, numericals & assignment discussion
<b>7</b>	2 <sup>nd</sup> week of June,2022		<b>FIELD EFFECT TRANSISTOR</b>
		1	Classification of FET, Advantages of FET over BJT
		2	Principle of operation of FET
		3	Principle of operation of FET
		4	FET parameters (no mathematical derivation) -> DC drain resistance -> AC drain resistance -> Trans-conductance
		5	Biasing of FET
		6	Previous year questions, numericals & assignment discussion
<b>8</b>	3 <sup>rd</sup> week of June,2022		<b>OPERATIONAL AMPLIFIERS</b>
		<b>1</b>	General circuit simple of OP-AMP and IC – CA – 741 OP AMP, Operational amplifier stages
		<b>2</b>	Equivalent circuit of operational amplifier, Open loop OP-AMP configuration
		<b>3</b>	OPAMP with feedback, Inverting OP-AMP
		<b>4</b>	Non inverting OP-AMP, Voltage follower & buffer
		<b>5</b>	Differential amplifier -> Adder or summing amplifier
		<b>6</b>	->Subtractor -> Integrator
		<b>7</b>	-> Differentiator
		<b>8</b>	-> Comparator
		<b>9</b>	Previous year questions, numericals & assignment discussion