

No	Information of Electronic Devices and Circuits (Analog)	
1	Unit name:	Electronic Devices and Circuits (Analog)
2	Code:	NE-3031
3	Classification:	Basic Electronic Subject
4	Credit value:	3
5	Semester/ Year Offered:	2/3
6	Pre-requisite:	NA
7	Mode of delivery:	Lecture, Practical
8	Assessment system and breakdown of marks:	Assignment, Tutorial, Exam
	Practical	20%
	Tutorial	20%
	Midterm	30%
	Exam	30%
9	Academic staff teaching unit:	Department of Nuclear Technology
10	<p>Course outcome of unit:</p> <p>After completion of this course, students will be able to</p> <ol style="list-style-type: none"> 1. explain insulators, conductors, semiconductors, n-type and p-type semiconductors 2. calculate and determine forward and reverse voltages and currents for diodes and to analyze the ripple factor for filtered bridge rectifier circuit 3. calculate and determine the maximum and minimum input voltages for zener diode 4. calculate and explain I_B, I_C, I_E, V_{BE}, V_{CE} and V_{CB} in the BJT transistor circuits 5. calculate and determine the Q-point value for I_C and V_{CE} for base bias, emitter bias, emitter-feedback bias, collector-feedback bias, and voltage divider bias circuits 6. explain Attenuation, CMRR, Common-Base Amplifier, Common-Emitter Amplifier, Common-Collector Amplifier, Differential Amplifier and determine the dc collector voltage and the ac collector voltage for amplifier circuits 7. derive and determine closed-loop voltage gain, input and output impedances of amplifiers 8. derive and determine mid-range open-loop voltage gain, and attenuation of RC Lag circuit and plot the curve of the phase-shift versus frequency 9. explain bandwidth (BW), phase shift, and slew rate and determine the bandwidths of each of the amplifiers and total phase lag 10. determine the rate of change of output voltages in response to the input waveforms for summing amplifiers, integrators and differentiators 	

11	<p>Synopsis of unit:</p> <p>“Electronic devices and circuits (Analog)” subject ensures that many semiconductor devices are based on the pn junction and operation and characteristics of the diode are covered. The first step is to learn about semiconductor transistors’ operation, including bipolar junction transistor (BJT) and field-effect transistor (FET). DC biasing is used to establish fixed dc values for the transistor currents and voltages called the dc operating point or quiescent point (Q-point) in order to operate as an amplifier. After all, these materials lay the groundwork for the study of amplifiers, and other circuits that require proper biasing.</p>
12	<p>Topic:</p> <ol style="list-style-type: none"> 1. Introduction to Electronics 2. Diode Applications 3. Special-Purpose Diodes 4. Bipolar Junction Transistors 5. Transistor Bias Circuits 6. BJT Amplifiers 7. The Operational Amplifier 8. Basic Op-Amp Circuits
13	<p>Main references:</p> <p>Electronic Devices, Electron Flow Version, Ninth Edition, Thomas L. Floyd</p>
14	<p>Additional references:</p> <p>www.pearesonhighered.com</p>