

ET2004 – Electronics II

Subject Code	ET2004	Subject Title	Electronics II			
Credits	4.0	Total Hours	Lectures	45 h	Pre-Requisites	ET2001
GPA/NGPA	GPA		Lab/Assignment	30 h		
Aims: The aim of this module is to develop knowledge to analyse and design electronic circuits for common applications						
Learning Outcomes						
On successful completion of this module, students are able to:						
<ol style="list-style-type: none"> Analyse, construct and design Analogue Electronic Circuits Analyse, construct and design Digital Electronic Circuits Develop skills in digital system design 						
LO 1.	Analyse, construct and design Analogue Electronic Circuits [25 h]					
	Transistor Amplifier:- Biasing circuits, self bias, small signal mid frequency ac equivalent circuits, h parameters of BJT, ac voltage gain, current gain, input and output impedances of a single stage amplifier, coupled amplifiers; Opamp:- Differential Amplifier, CMRR, opamp behaviour and opamp amplifiers, summer, integrator, differentiator, wave shaping, active filters, oscillators; Power Electronic devices:- Thyristor, Triac, Diac, Unijunction Transistor, power MOSFET, IGBT and their applications; Power Amplifier classes and efficiency:- Power transistors, transistor power dissipation, harmonic distortion, Class B and Class AB amplifiers; Power Supplies and voltage regulators (linear and switch mode):- AC to DC converters, DC to DC converters					
LO 2.	Analyse, construct and design Digital Electronic Circuits [10 h]					
	Different types of ADC and DAC; Programmable Logic Devices:- ALU, PAL, PLA, ROM, RAM and DRAM; Microcontrollers					
LO 3.	Develop skills in digital system design [10 h]					
	Introduction to digital system design concepts; Introduction to Verilog HDL:- modeling styles, abstract levels; Simulations of digital circuits and implementation on FPGA using Xilinx ISE					
Practical Work: 5 lab experiments [5×3 h]						
	<ol style="list-style-type: none"> BJT - CE amplifier with self bias: measure dc bias voltages and ac voltage gain of an audio signal FET - CS amplifier with fixed bias: measure dc bias voltages and ac voltage gain of an audio signal AC power control – Thyristor, Triac, Diac Opmp - amplifiers, integrator, differentiator, active filter circuits Microcontroller application OR a simple digital system simulation using FPGA 					
Tutorial work: 5 classes [5×1 h]						
Assignments: 2 assignments [2×5 h]						
Assessment						
	a. Practical Work:					10%
	b. One Tutorial test:					10%
	c. Assignment (a): Design and build an Analogue circuit		5 th week			10%
	d. Assignment (b): Design and build a Digital circuit		10 th week			10%
	e. End Semester Written Examination: 3 h test					60%
Rec. Bks.	1. Electronic devices and Circuits by Theodore F Bogart Publisher: Prentice Hall, 1997 ISBN: 0133937607; 9780133937602 2. Digital Systems Principles and Applications by Ronald J Tocci Publisher: Prentice Hall Inc, India: 1995 ISBN: 81-203-0985-5					