

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)					
AY 2023-24					
Course Information					
Programme	B.Tech. (Electronics Engineering)				
Class, Semester	Third Year B. Tech., Sem. -V				
Course Code	6OE357				
Course Name	Open Elective-1: Introduction to Electronic Systems				
Desired Requisites:	Basic Electronics Engineering				
Teaching Scheme		Examination Scheme (Marks)			
Lecture	3 Hrs/week	MSE	ISE	ESE	Total
Tutorial	-	30	20	50	100
Credits: 3					
Course Objectives					
1	To illustrate the concept behind electronics systems and its application.				
2					
3					
4					
Course Outcomes (CO) with Bloom's Taxonomy Level					
At the end of the course, the students will be able to,					
CO1	Explain the working of components used in the electronic systems.				Understand
CO2	Develop a digital circuit for a given logic and build circuit for given specifications.				Apply
CO3	Analyze the performance of Data Acquisition System and Power Electronics Circuits.				Analyze
CO4	Test embedded system applications using Arduino board.				Apply
Module	Module Contents				Hours
I	Electronic System Components Transducers-Types, Classification, Characteristics: Signal Conditioning of inputs, Instrumentation Amplifiers, Capacitive type, Inductive type sensors, Limit switches, Temperature sensors:RTD, thermistor, Thermocouple, semiconductor diode sensor, piezoelectric transducer photovoltaic cell, LDR, Speed measurement using magnetic photoelectric pickup. Distance measurement: LVDT, capacitive transducers, Resistive, Glass scales, Magnetic scales. Concept of Quadrature output and index pulse.PH Sensors, ProximitySensors, Motion Sensors.				7
II	Operational Amplifier Differential amplifier, Basic op-Amp configuration, Ideal op-amp analysis, Op-amp characteristics, Inverting and Non inverting amplifiers, Adder, Subtractor, voltage to current converters, current to voltage converters, instrumentation amplifiers, Active filters. Voltage comparator, Comparator application, waveform generators: multivibrators, oscillators.				8
III	Digital Systems Flip-flops, Counters, Up-counters, Down Counters, Mod-N counters, State diagram.				5
IV	Data Acquisitions System Digital to Analog Converter (DAC), Analog to Digital converter (ADC), Data Acquisition System (DAS): introduction, objectives of DAS, single and multichannel, data conversion, sample and hold circuit, elements of DAS, interfacing of transducers-multiplexing.				7
V	Power Semiconductor Devices and its Applications SCR, TRIAC, DIAC, UJT, AC voltage regulator, Controlled rectifiers, Inverters, Speed control of AC and DC motors, SMPS,UPS, Electronics lamp ballast.				5

VI	Embedded Systems Introduction to microcontroller based system: Arduino board, Arduino based systems, Simple Arduino program, interfacing display board to Arduino, Speed control of DC motor, motor driver IC: L293D.	8
Textbooks		
1	R. Boylestad and L. Nashelsky, "Electronics Devices and Circuits", 8th Edition, Prentice Hall International, 2005.	
2	Anand Kumar, "Fundamentals of Digital circuits", 2nd Edition, PHI, 2009.	
3	A. K. Sawhney, "Measurements and Instrumentation", Dhanpat Rai and Sons, 2013	
4		
References		
1	R. P. Jain, "Modern Digital Design", Mc-Graw-Hill, 2008	
2	Ramakant Gaikwad, "Op-amps and Linear Integrated Circuits", Pearson Education, 2011.	
3	M.D. Singh and KB Khanchandani, "Power Electronics", 2nd Edition, McGraw-Hill, 2007.	
4		
Useful Links		
1	www.spoken-tutorial.org ---IIT Bombay.	
2		
3		
4		

CO-PO Mapping														
	Programme Outcomes (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3													2
CO2	3		2											2
CO3		3												3
CO4	3		2											3

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

Assessment
<p>The assessment is based on MSE, ISE and ESE.</p> <p>MSE shall be typically on modules 1 to 3.</p> <p>ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.</p> <p>ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.</p> <p>For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)</p>