

Course Number and Name	
BGE004 - ELECTRONICS FOR MECHANICAL SYSTEMS	
Credits and Contact Hours	
3&45	
Course Coordinator's Name	
Dr.Bachshumiyan	
Text Books and References	
TEXTBOOKS:	
1.Goankar R.S., Microprocessor Architecture programming and Applications, New Age International.2006.	
2.W.Bolton, Mechatronics, Addison Wesley Longman, 2006.	
REFERENCES:	
1. M.Morris Mono, Digital Design, 3 rd Edition, Prentice Hall of India Pvt Ltd.,2003/Pearson Education(Singapore) Pvt Ltd.,New Delhi.,2003.	
2. Malvino A.P., Digital Electronics, Principle and Applns.-TMH 1989V.K. Mehta, Principle of Electronics, S.Chand& Company, 2007.	
3. Kenneth J.Ayala."The 8086 Microprocessor: Programming & Interfacing the PC"Delmar Publishers, 2007.	
4. Douglas V., Hall, Microprocessors Interfacing,Programming And Hardware, TMH 2007.	
5. https://www.amazon.com/Mechatronics-Electronic-mechanical...ebook	
Course Description	
To enable the students to understand the fundamental concepts of Semi Conductors, Transistors, Rectifiers, Digital Electronics and 8085 Microprocessors	
Prerequisites	Co-requisites
MECHATRONICS	Nil
required, elective, or selected elective (as per Table 5-1)	
Course Outcomes (COs)	
CO1	Upon completion of this course, the students can able to understand digital electronics
CO2	Learn concepts of 8085 architecture
CO3	Learn the concepts of signal generators
CO4	Learn the concepts of programming
CO5	Learn the concepts of applications in mechanical system
CO6	Learn the concepts of braking and steering system

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	H											
CO2		H						H				
CO3			H		M							H
CO4				M		L	M		L			
CO5										L	L	
CO6												

List of Topics Covered

UNIT I	DIGITAL ELECTRONICS	9
<p>Basic logic Gates - Application of logic gates – De-Morgan’s theorem-Boolean Expression-Minimization of Boolean expression-Minterm - Maxterm-Sum of Products(SOP)-Product of Sum(POS)–K-MAP- Digital Comparators – Code Converter – Adders – Sequential logic – Flip flops – SR/JK/D – Counters – Synchronous and Asynchronous – Shift registers – Memory I.C’s – RAM, ROM, EPROM – Multiplexers – Demultiplexers - Decoders – Encoders.</p>		
UNIT II	SIGNAL GENERATORS	9
<p>Operational Amplifier / Inverting / Noninverting / Summing / Integrating / Differential / Logarithmic –Bridge Measurements-Maxwell,Hay,Schering,Andeson,Weinbridge,Wheat Stone Bridge - Comparison of Analog& Digital Techniques, Electronic multimeter,Function generator-Pulse and Square wave Generator-Harmonic Distortion</p>		
UNIT III	8085 ARCHITECTURE	9
<p>Block diagram with CPU – Input/output – Components and features of CPU – Program Instructions -Control Unit - Arithmetic logic unit – Registers – Significance of data, address and control bus – Architecture of Intel 8085A and Pin Configuration.</p>		
UNIT IV	MICROPROCESSOR PROGRAMMING	9
<p>Programming concepts – Machine code – Hex code – Basic concepts of assembly language – Instruction sets – Addressing modes – Assembly language programming examples – Addition of 8 bit numbers in two memory addresses – Subtraction, Multiplication – Division -Determination of the biggest number in the list of numbers - Counting – sorting – Delay subroutine – Delay with stepper motors.</p>		
UNIT V	APPLICATIONS IN MECHANICAL SYSTEMS	9
<p>Introduction-Generation of I/O ports-Programmable peripheral Interface(PPI)- Intel 8255 -Keyboard and Display Controller(8279) ,Traffic light control-washing Machine control –DC Motor-Stepper Motor- D/A Converters- A/D converters–Automotive applications – Antilock braking – Steering – transmission and suspension systems- Illustrative Examples.</p>		