Department of Electronics

COs & PSOs with relevance to local/regional needs, national needs and global needs

Chart 1:

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St	. Course	Course/SECs	Year of	COs & PSOs with relevance to	COs & PSOs with relevance to national	COs & PSOs with relevance to global
N	o. Code	Titles (Proposed	Introdu	local/regional needs	needs	needs
1		new)	ction			
1	DSC-	Network	2018-19	CO1: Able to analyse and solve	CO1: Able to analyse and solve	CO1: Able to analyse and solve
1	1005A1	Analysis	2010-19	complex electrical circuits by applying	complex electrical circuits by applying	complex electrical circuits by applying
1	1000111	· maryons		fundamental laws	fundamental laws	fundamental laws
1				CO2: Able to analyse and understand		CO2: Able to analyse and understand
	1			the behaviour of linear electrical circuits		the behaviour of linear electrical circuits
	1			with two ports	with two ports	with two ports
				CO3: Understand diode operation,		CO3: Understand diode operation,
1				characteristics, and applications,	characteristics, and applications,	characteristics, and applications,
1				enabling them to analyse and design	enabling them to analyse and design	enabling them to analyse and design
1				basic electronic circuits involving	basic electronic circuits involving	basic electronic circuits involving
			1	diodes.	diodes.	diodes.
				CO4: Understanding principles of	CO4: Understanding principles of	CO4: Understanding principles of
				power supply design, calculating		power supply design, calculating
				voltage and current requirements, and	voltage and current requirements, and	voltage and current requirements, and
				practical knowledge of rectification and	practical knowledge of rectification and	practical knowledge of rectification and
<u> </u>		1		voltage regulation techniques	voltage regulation techniques	voltage regulation techniques
2		Analog	2018-19	CO1: Able to understand BJT structure,	CO1: Able to understand BJT structure,	CO1: Able to understand BJT structure,
	1005A2	Electronics-I		operation, biasing, and applications in	operation, biasing, and applications in	operation, biasing, and applications in
				amplification and switching circuits in	amplification and switching circuits in	amplification and switching circuits in
	-		1	electronic systems."	electronic systems."	electronic systems."
				CO2: Principles of operation,	CO2: Principles of operation,	CO2: Principles of operation,
1				characteristics, and practical	characteristics, and practical	characteristics, and practical
1				applications of unipolar devices, such as JFETs, for electronic circuit design and	applications of unipolar devices, such as	applications of unipolar devices, such as
				analysis.	JFETs, for electronic circuit design and analysis.	JFETs, for electronic circuit design and
				CO3: Understanding transistor		analysis.
				structure, operation, different transistor	CO3: Understanding transistor structure, operation, different transistor	CO3: Understanding transistor
				amplifier configurations, and designing	amplifier configurations, and designing	structure, operation, different transistor
				circuits for amplification.	circuits for amplification.	amplifier configurations, and designing circuits for amplification.
	100	QLLEGE &		CO4: Understand the principles of	CO4: Understand the principles of	CO4: Understand the principles of
	NAME	12		feedback in amplifiers, different	feedback in amplifiers, different	feedback in amplifiers, different
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	STD \\ \\ \\ \\ \\ \\ \		feedback circuits, and comprehend the	feedback circuits, and comprehend the	feedback circuits, and comprehend the
	- NIVERAL STATES	STD WAR		operation of oscillators.	operation of oscillators.	operation of oscillators.
	16	1964				•

3	DCC					
3	DSC-	Linear	2018-19	CO1: Fundamental principles,	CO1: Fundamental principles,	CO1: Fundamental principles,
	1005B1	Integrated		characteristics, and applications of		characteristics, and applications of
		Circuits		operational amplifiers (op-amps)	operational amplifiers (op-amps)	operational amplifiers (op-amps)
			1	CO2: Understanding of the 555 timer	CO2: Understanding of the 555 timer	CO2: Understanding of the 555 timer
				IC, its internal block diagram, and	IC, its internal block diagram, and	IC, its internal block diagram, and
1				operation as an astable, monostable	operation as an astable, monostable	operation as an astable, monostable
	1		-	and bistable multivibrator.	and bistable multivibrator.	and bistable multivibrator.
				CO3: Analyse, design, and optimize	CO3: Analyse, design, and optimize	CO3: Analyse, design, and optimize
1				these circuits for various combinational	these circuits for various combinational	these circuits for various combinational
1				circuits like, multiplexers,	circuits like, multiplexers,	circuits like, multiplexers,
4				dumultiplexer, encoder and decoders for	dumultiplexer, encoder and decoders for	dumultiplexer, encoder and decoders for
	1		1	digital system design application.	digital system design application.	digital system design application.
				CO4: Understand the principles, types,	CO4: Understand the principles, types,	CO4: Understand the principles, types,
		4		and importance of resolution of digital-	and importance of resolution of digital-	and importance of resolution of digital-
				to-analog and analog-to-digital	to-analog and analog-to-digital	to-analog and analog-to-digital
				conversion.	conversion.	conversion.
4	DSC-	Digital	2018-19	CO1: fundamental understanding of	CO1: fundamental understanding of	CO1: fundamental understanding of
	1005B2	Integrated		how numbers are represented and	how numbers are represented and	how numbers are represented and
		Circuits		manipulated in different bases, as well	manipulated in different bases, as well	manipulated in different bases, as well
				as how to perform arithmetic operations	as how to perform arithmetic operations	as how to perform arithmetic operations
				using binary, octal, and hexadecimal	using binary, octal, and hexadecimal	using binary, octal, and hexadecimal
				numbering systems	numbering systems	numbering systems
				CO2: fundamental principles of logic	CO2: fundamental principles of logic	CO2: fundamental principles of logic
				gates and their applications in circuit	gates and their applications in circuit	gates and their applications in circuit
				design, demonstrate proficiency in	design, demonstrate proficiency in	design, demonstrate proficiency in
				Boolean algebra operations, simplifying	Boolean algebra operations, simplifying	Boolean algebra operations, simplifying
	/	ESTD JUNE 1964		and optimizing logical expressions	and optimizing logical expressions	and optimizing logical expressions
1 1	JAN .	12		CO3: fundamental principles of	CO3: fundamental principles of	CO3: fundamental principles of
	3	ESTD \3		sequential logic, including the concepts	sequential logic, including the concepts	sequential logic, including the concepts
	NE NE	JUNE 5		of flip-flops, types of flip-flop, latches,	of flip-flops, types of flip-flop, latches,	of flip-flops, types of flip-flop, latches,
	(\$)	1964		clocking, and state machines.	clocking, and state machines.	clocking, and state machines.
	15			CO4: design and analyse of shift	CO4: design and analyse of shift	CO4: design and analyse of shift
	12	Wered Autono		registers and counters, including various	registers and counters, including various	registers and counters, including various
				types such as parallel load operation and	types such as parallel load operation	types such as parallel load operation
				ring counter.	and ring counter.	and ring counter.
5	DSC	Electronics	2019-20	CO1: Understanding of principles and	CO1: Understanding of principles and	CO1: Understanding of principles and
	1005C1	Communication		technologies related to electronic	technologies related to electronic	technologies related to electronic
	.00001			communication systems.	communication systems.	communication systems.
		_		CO2: Understand the principles of	CO2: Understand the principles of	CO2: Understand the principles of
				analog modulation techniques, such as	analog modulation techniques, such as	analog modulation techniques, such as
				AM and FM, and learn to demodulate	AM and FM, and learn to demodulate	AM and FM, and learn to demodulate
				DATE OF STATE OF STAT		

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	1			signals.	signals.	signals.
				CO3: Understand the impact of	CO3: Understand the impact of	CO3: Understand the impact of
				modulation parameters (e.g. modulation	modulation parameters (e.g. modulation	modulation parameters (e.g. modulation
	1			index, deviation) on signal	index, deviation) on signal	index, deviation) on signal
1				characteristics.	characteristics.	characteristics.
				CO4: Understand the principles of	CO4: Understand the principles of	CO4: Understand the principles of
1				satellite communication, including orbit	satellite communication, including orbit	satellite communication, including orbit
1			1	types, transponders, and satellite	types, transponders, and satellite	types, transponders, and satellite
	Dag			system design.	system design.	system design.
6	DSC	Microprocessor	2019-20	CO1: Fundamental principles of	CO1: Fundamental principles of	CO1: Fundamental principles of
	1005C2	8085		microcomputer organization, including	microcomputer organization, including	microcomputer organization, including
				CPU architecture, memory systems,	CPU architecture, memory systems,	CPU architecture, memory systems,
				input/output interfaces, and bus	input/output interfaces, and bus	input/output interfaces, and bus
	1	1		structures.	structures.	structures.
				CO2: Identify Architecture and	CO2: Identify Architecture and	CO2: Identify Architecture and
				operation of the 8085 microprocessor	operation of the 8085 microprocessor	operation of the 8085 microprocessor
				CO3: Demonstrate a comprehensive	CO3: Demonstrate a comprehensive	CO3: Demonstrate a comprehensive
				understanding of the various	understanding of the various	understanding of the various
				instructions in the 8085	instructions in the 8085	instructions in the 8085
				Microprocessor instruction set.	Microprocessor instruction set.	Microprocessor instruction set.
				CO4: Proficient in writing 8085	CO4: Proficient in writing 8085	CO4: Proficient in writing 8085
				assembly language programs to solve a	assembly language programs to solve a	assembly language programs to solve a
7	DCC		2010.20	variety of computational problems.	variety of computational problems.	variety of computational problems.
1	DSC	Advance	2019-20	CO1: Understanding of analog pulse	CO1: Understanding of analog pulse	CO1: Understanding of analog pulse
	1005D1	Communication		modulation techniques such as Pulse	modulation techniques such as Pulse	modulation techniques such as Pulse
				Amplitude Modulation, Pulse Width	Amplitude Modulation, Pulse Width	Amplitude Modulation, Pulse Width
				Modulation, and Pulse Position	Modulation, and Pulse Position	Modulation, and Pulse Position
				Modulation.	Modulation.	Modulation.
				CO2: Identify the Principals of Digital	CO2: Identify the Principals of Digital	CO2: Identify the Principals of Digital
1		OLLEGE		Modulation and Data Communication	Modulation and Data Communication	Modulation and Data Communication
1	ANO.	octo!		techniques	techniques	techniques
	VIIVERALL	STD UNE		CO3: Understanding of the architecture,	CO3: Understanding of the architecture,	CO3: Understanding of the architecture,
	18/ 9	UNE)		components, and operation of mobile	components, and operation of mobile	components, and operation of mobile
	\$	1064		telephony systems, including both	telephony systems, including both	telephony systems, including both
	14	1304 /5		cellular networks and mobile devices.	cellular networks and mobile devices.	cellular networks and mobile devices.
	Bowe	1964 Autonomous		CO4: Understand the mobile	CO4: Understand the mobile	CO4: Understand the mobile
		ed Auto		communication protocols and wireless	communication protocols and wireless	communication protocols and wireless
0	Pag		2010.20	technologies.	technologies.	technologies.
8	DSC	Microcontroller	2019-20	CO1: Identify the building blocks of		CO1: Identify the building blocks of
	1005D2	8051	,	8051 microcontroller.	8051 microcontroller.	8051 microcontroller.
L				CO2: Write assembly language program	CO2: Write assembly language program	CO2: Write assembly language program

9	DSE 1005E1	Section I- Linear Integrated Circuits, Section II- 8051 Microcontroller Interfacing and Embedded C	2020-21	for 8051 microcontroller. CO3: Demonstrate Timer, Counter & Serial Port Programming with 8051 microcontroller. CO4: Develop the skills to interface and communicate with external devices. CO.1Understand the fundamentals of Operational Amplifier. CO.2 Design various linear and nonlinear circuits using Op-amp. CO.3 Understand the fundamentals of rectifiers and filters circuits using Op-amp. CO.4 Understand applications of Phase Locked Loops (PLL). CO.1 Understand the fundamentals and areas of applications for 8051 microcontroller. CO.2 Interface I/O devices to 8051. CO.3 Understand serial communication facility in 8051. CO.4 Design monitoring and control	nonlinear circuits using Op-amp. CO.3 Understand the fundamentals of rectifiers and filters circuits using Op-amp. CO.4 Understand applications of Phase Locked Loops (PLL). CO.1 Understand the fundamentals and areas of applications for 8051 microcontroller. CO.2 Interface I/O devices to 8051. CO.3 Understand serial communication facility in 8051. CO.4 Design monitoring and control	nonlinear circuits using Op-amp. CO.3 Understand the fundamentals of rectifiers and filters circuits using Op-amp. CO.4 Understand applications of Phase Locked Loops (PLL). CO.1 Understand the fundamentals and areas of applications for 8051 microcontroller. CO.2 Interface I/O devices to 8051. CO.3 Understand serial communication facility in 8051. CO.4 Design monitoring and control
10	1964 /	Section I Instrumentation, Antenna Section II Wave Propagation	2020-21	circuits with 8051. CO.1 Classify and explain transducers with examples, including those for measurement of temperature, flow, motion, position and light. CO.2 Knowledge of sensor and Actuators CO.3Analyze the performance characteristics of each instrument CO.4 Illustrate basic Digital instruments such as Digital voltmeters and Multimeter, Bio- Medical Instrument CO.1 Apply the principles of electromagnetic to explain antenna characteristics such as radiation pattern and directivity. CO.2 Understand the structure and working of special antennas such as	with examples, including those for measurement of temperature, flow, motion, position and light. CO.2 Knowledge of sensor and Actuators CO.3Analyze the performance characteristics of each instrument CO.4 Illustrate basic Digital instruments such as Digital voltmeters and Multimeter, Bio- Medical Instrument CO.1 Apply the principles of electromagnetic to explain antenna characteristics such as radiation pattern and directivity. CO.2 Understand the structure and	with examples, including those for measurement of temperature, flow, motion, position and light. CO.2 Knowledge of sensor and Actuators CO.3Analyze the performance characteristics of each instrument CO.4 Illustrate basic Digital instruments such as Digital voltmeters and Multimeter, Bio- Medical Instrument CO.1 Apply the principles of electromagnetic to explain antenna characteristics such as radiation pattern and directivity.

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		N		Dipole antenna, Yagi-Uda antenna and		Dipole antenna, Yagi-Uda antenna and
				Microstrip patch antennas.	Microstrip patch antennas.	Microstrip patch antennas.
				CO.3 Identify the suitable antenna for a	CO.3 Identify the suitable antenna for a	CO.3 Identify the suitable antenna for a
		1		given communication system.	given communication system.	given communication system.
				CO.4 Be familiar with the basic		
				propagations namely ground wave		
				propagation, free space propagation and	propagation, free space propagation and	propagation, free space propagation and
				sky wave propagation.	sky wave propagation.	sky wave propagation.
11	SEC-3	Renewable		CO.1 To understand the Need,	CO.1 To understand the Need,	CO.1 To understand the Need,
		energy	2020-21	importance and scope of non-	importance and scope of non-	importance and scope of non-
				conventional and alternate energy	conventional and alternate energy	conventional and alternate energy
		1		resources.	resources.	resources.
				CO.2 To understand role significance of	CO.2 To understand role significance of	CO.2 To understand role significance of
				solar energy & Wind Energy.	solar energy & Wind Energy.	solar energy & Wind Energy.
				CO.3 To understand the role of ocean		CO.3 To understand the role of ocean
				energy in the Energy Generation.	energy in the Energy Generation.	energy in the Energy Generation.
				CO.4 To understand the concept of		CO.4 To understand the concept of
				energy Conservation.	energy Conservation.	energy Conservation.
12	DSE	Section I-	2020-21	CO.1Describe typical concepts and		CO.1Describe typical concepts and
	1005F1	Industrial Process				
		Control, PLC		Controller.	Controller.	Controller.
		Programming		CO.2 Use timer, counter, and other	CO.2 Use timer, counter, and other	
				intermediate programming functions.	intermediate programming functions.	intermediate programming functions.
				CO.3 Design and program basic PLC		CO.3 Design and program basic PLC
				circuits for entry-level PLC applications.		circuits for entry-level PLC applications.
					CO.4 Explain and apply the concept of	CO.4 Explain and apply the concept of
				electrical ladder logic, its history, and its	electrical ladder logic, its history, and its	electrical ladder logic its history and its
				relationship to programmed PLC		relationship to programmed PLC
				instruction.	instruction.	instruction.
- 1		Section II-		CO.1 Understand the architecture and	CO.1 Understand the architecture and	
- 1		Advanced		function of each pin of AVR 8-bit	function of each pin of AVR 8-bit	function of each pin of AVR 8-bit
	1	Microcontroller		Microcontroller.		Microcontroller.
- 1	1	and		CO.2 Write, debug and simulate	CO.2 Write, debug and simulate	CO.2 Write debug and simulate
- 1	1	Embedded	l	embedded C language programs.		embedded C language programs.
	-	System	1		CO.3 Understand Timer operation,	CO 3 Understand Timer operation
				Interrupt environment and Serial	Interrupt environment and Serial	Interrupt environment and Serial
	1	O COLLEGE 4		Communication.	Communication.	Communication
	13	14		CO.4 Understand the interfacing of	CO.4 Understand the interfacing of	CO 4 Understand the interfacing of
	131	ESID /		various systems with AVR	various systems with AVR	various systems with AVR
	[3]	JUNE 7		The second secon		microcontroller
	131	ESTD JUNE 1964				merocondoner
	/g	o See				
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12	DOD					
13	DSE	Section I- Power	2020-21	CO.1Understand the fundamentals of	CO.1Understand the fundamentals of	CO.1Understand the fundamentals of
	1005F2	Electronics		Power semiconductor devices	Power semiconductor devices	Power semiconductor devices
1	1			CO.2Understand the types,	CO.2Understand the types,	CO.2Understand the types,
1	1			characteristics, and applications of	characteristics, and applications of	characteristics, and applications of
1				Thyristors	Thyristors	Thyristors
1				CO.3Understand and analyse	CO.3Understand and analyse	CO.3Understand and analyse
1		1		performance of controlled and	performance of controlled and	performance of controlled and
1				uncontrolled converters.	uncontrolled converters.	uncontrolled converters.
1	1.			CO.4Familiarize with different	CO.4Familiarize with different	CO.4Familiarize with different
1				applications of Power Electronics.	applications of Power Electronics.	applications of Power Electronics.
1		Section II- FPGA		CO.1Understand the fundamentals of	CO.1Understand the fundamentals of	CO.1Understand the fundamentals of
1		& VHDL		programmable logic devices.	programmable logic devices.	programmable logic devices.
		Programming		CO.2 Understand the syntax and	CO.2 Understand the syntax and	CO.2 Understand the syntax and
				behaviour of the VHDL language.	behaviour of the VHDL language.	behaviour of the VHDL language.
				CO.3 Use modern development tools to	CO.3 Use modern development tools to	CO.3 Use modern development tools to
				design complex digital circuits	design complex digital circuits	design complex digital circuits
- 1				CO.4 Simulate and make a synthesis of	CO.4 Simulate and make a synthesis of	CO.4 Simulate and make a synthesis of
				extensive designs in so called "Field	extensive designs in so called "Field	extensive designs in so called "Field
				Programmable Gate Array" (FPGA).	Programmable Gate Array" (FPGA).	Programmable Gate Array" (FPGA).
14	SEC-4	Introduction to	2020-21	CO.1 Students will be familiarizing	CO.1 Students will be familiarizing	CO.1 Students will be familiarizing
1		Arduino and IoT		with Arduino Board & Accessories.	with Arduino Board & Accessories.	with Arduino Board & Accessories.
- 1				CO.2 Students will be familiarizing	CO.2 Students will be familiarizing	CO.2 Students will be familiarizing
1				with interfacing with display devices	with interfacing with display devices	with interfacing with display devices
- 1				and sensors.	and sensors.	and sensors.
				CO.3 Students will be able design some	CO.3 Students will be able design some	CO.3 Students will be able design some
				IoT based prototypes	IoT based prototypes	IoT based prototypes
				CO.4 Understand the physical and	CO.4 Understand the physical and	CO.4 Understand the physical and
				logical design on IoT.	logical design on IoT.	logical design on IoT.
15	DSC-	Analog	2021-22	CO1: Identify and explain electrical	CO1: Identify and explain electrical	CO1: Identify and explain electrical
- 1	1005A1	Electronics-I		components and determine the value of	components and determine the value of	components and determine the value of
- 1				resistor, inductor and capacitor using	resistor, inductor and capacitor using	resistor, inductor and capacitor using
- 1				color code method.	color code method.	color code method.
- 1				CO2: Understand the basic properties of	CO2: Understand the basic properties of	CO2: Understand the basic properties of
- 1		COLLEGE		electrical elements, and solve DC circuit	electrical elements, and solve DC	electrical elements, and solve DC
- 1	3	10/2		analysis problems, DC network		circuit analysis problems, DC network
	18/	ESTD \3		theorems.	theorems.	theorems.
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	JUNE F		CO3: Acquire the knowledge about the		CO3: Acquire the knowledge about the
	13/	1964 /5/		characteristics and working principles		characteristics and working principles
	14	- Les		of PN junction diode, Zener diode,		of PN junction diode, Zener diode,
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ESTD JUNE 1964		photo diode, LED and different diode		photo diode, LED and different diode
				applications.	applications.	applications.

	1		T			
1				CO4: Understanding and study of	CO4: Understanding and study of	CO4: Understanding and study of
				rectifier, fifter and voltage regulator	rectifier, filter and voltage regulator	rectifier, filter and voltage regulator
16	DSC-	Digital	2021.22	circuits.	circuits.	circuits.
1.0	1005A2	Digital	2021-22	CO1: Understanding the basics of	CO1: Understanding the basics of	
	1003/12	Electronics-I		Digital Electronics, different number	Digital Electronics, different number	Digital Electronics, different number
1				systems, Binary Codes and signed	systems, Binary Codes and signed	systems, Binary Codes and signed
			1	representation of binary number. Also	representation of binary number. Also	representation of binary number. Also
				understand the conversion between	understand the conversion between	understand the conversion between
-				different number systems and solve the	different number systems and solve the	different number systems and solve the
1				binary arithmetic problems.	binary arithmetic problems.	binary arithmetic problems.
1				CO2: Design and construction of the	CO2: Design and construction of the	CO2: Design and construction of the
1				basic and universal logic gates and	basic and universal logic gates and	basic and universal logic gates and
				studying the Boolean algebra and	studying the Boolean algebra and	studying the Boolean algebra and
	1			simplification of Boolean expression	simplification of Boolean expression	simplification of Boolean expression
ŀ	1			using different methods.	using different methods.	using different methods.
ł				CO3: Understanding and comparing	CO3: Understanding and comparing	CO3: Understanding and comparing
				different logic families according IC	different logic families according IC	different logic families according IC
				specifications and their circuit	specifications and their circuit	specifications and their circuit
				configurations.	configurations.	configurations.
				CO4: Understand, analyse and design	CO4: Understand, analyse and design	CO4: Understand, analyse and design
17	DSC-	Analog	2021-22	various combinational circuits.	various combinational circuits.	various combinational circuits.
17	1005B1	Electronics-II	2021-22	CO1: Analyse output in different operating modes of Bipolar Junction		CO1: Analyse output in different
1	TOOSBI	Licetomes-ii		Transistor and Demonstrate the	operating modes of Bipolar Junction Transistor and Demonstrate the	operating modes of Bipolar Junction
1	1			operating principle and output		Transistor and Demonstrate the
1				characteristics of Bipolar Junction	operating principle and output characteristics of Bipolar Junction	operating principle and output characteristics of Bipolar Junction
				Transistor	Transistor	Transistor
1				CO2: Explain construction and	CO2: Explain construction and	the contract of the contract o
1		COLLEGE		characteristics of JFETs, MOSFETs and	characteristics of JFETs, MOSFETs and	characteristics of JFETs, MOSFETs and
	N Si	ESTD JUNE 1964		UJT.	UJT.	UJT.
	3/	ESTD \\$		CO3: Design biasing circuits for BJT	560-469-019-01	
1		JUNE 2		and study different coupling methods	and study different coupling methods	and study different coupling methods
	=	1964		used in multistage amplifiers	used in multistage amplifiers	used in multistage amplifiers
1	19	1004			CO4: Analyse the importance of	CO4: Analyse the importance of
1	100	ered Autonomo		feedback in amplifiers. Apply the	feedback in amplifiers. Apply the	
		- CO AUT		knowledge gained in the design of	knowledge gained in the design of	knowledge gained in the design of
				transistorized circuits and Oscillators.	transistorized circuits and Oscillators.	transistorized circuits and Oscillators.
18	DSC-	Digital	2021-22	CO1: Understand, analyse and design	CO1: Understand, analyse and design	CO1: Understand, analyse and design
	1005B2	Electronics-I		various sequential circuits.	various sequential circuits.	various sequential circuits.
				CO2: Understanding the working of	CO2: Understanding the working of	
				different shift registers and counters.	different shift registers and counters.	different shift registers and counters.

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				CO3: Became able to know various	CO3: Became able to know various	CO3: Became able to know various
				types of analog to digital converters and	types of analog to digital converters and	types of analog to digital converters and
				digital to analog converters.	digital to analog converters.	digital to analog converters.
			1 1	CO4: Explain and compare the working	CO4: Explain and compare the working	CO4: Explain and compare the working
1				of multivibrators using special	of multivibrators using special	of multivibrators using special
				application IC 555. Understanding and	application IC 555. Understanding and	application IC 555. Understanding and
				designing of multivibrator circuits.	designing of multivibrator circuits.	designing of multivibrator circuits.
19	DSC	Electronic	2022-23	CO1: Identify the basic concepts of	CO1: Identify the basic concepts of	CO1: Identify the basic concepts of
	1005C1	Communication	1	electronic communication	electronic communication	electronic communication
				CO2: Identity different Modulation &	CO2: Identity different Modulation &	CO2: Identity different Modulation &
1				Demodulation schemes for analog	Demodulation schemes for analog	Demodulation schemes for analog
				communications (AM, FM, PM)	communications (AM, FM, PM)	communications (AM, FM, PM)
l	1			CO3: Illustrate the various analog Pulse	CO3: Illustrate the various analog Pulse	CO3: Illustrate the various analog Pulse
				Modulation techniques	Modulation techniques	Modulation techniques
				CO4: Identify the principals of Digital	CO4: Identify the principals of Digital	CO4: Identify the principals of Digital
1			1	Modulation & Data Communication	Modulation & Data Communication	Modulation & Data Communication
				techniques	techniques	techniques
20	DCC	\C	2022 22	CO1: Identify various components of	CO1: Identify various components of	CO1: Identify various components of
20	DSC	Microprocessor	2022-23		Microcomputer system	Microcomputer system
	1005C2	8085		Microcomputer system	CO2: Identify Architecture of 8085	CO2: Identify Architecture of 8085
				CO2: Identify Architecture of 8085	microprocessor	microprocessor
				microprocessor	CO3: Familiar with instructions set and	CO3: Familiar with instructions set and
				CO3: Familiar with instructions set and		addressing modes of 8085
				addressing modes of 8085	uddi. 000	microprocessor
				microprocessor	microprocessor CO4:Write assembly language	CO4:Write assembly language
			ŀ	CO4:Write assembly language		programs for 8085 microprocessor
				programs for 8085 microprocessor	programs for 8085 microprocessor	l' - '
21	DSC	Operational	2022-23	CO1: Discuss the op-amps basic	CO1: Discuss the op-amps basic	construction, characteristics
	1005D1	Amplifier		construction, characteristics,	construction, characteristics,	parameters, various configurations
	10002	1		parameters, various configurations	parameters, various configurations	CO2: Design various linear and non-
	1			CO2: Design various linear and non-	CO2: Design various linear and non-	
				linear circuits using op-amp	linear circuits using op-amp	linear circuits using op-amp
	İ	1		CO3: Design various waveform	CO3: Design various waveform	005. 210.6
					generators	generators
				CO4: Design comparators and rectifiers	CO4: Design comparators and rectifiers	CO4: Design comparators and rectifier
				using Op-amp.	using Op-amp.	using op unip.
		1 Composted los	2022-23	CO1: Identify the building blocks of	CO1: Identify the building blocks of	CO1: Identify the building blocks o
22	DSC	Microcontroller		8051 microcontroller	8051 microcontroller	8051 microcontroller
	1005D2	8051		CO2: write assembly program for 8051	CO2: write assembly program for 8051	CO2: write assembly program for 805
		COLLEGE		microcontroller	microcontroller	microcontroller
		J. T.	181	CO3: Demonstrate Timer & Counter	CO3: Demonstrate Timer & Counter	CO3: Demonstrate Timer & Counter
		S ESTD	Stap III	CO3: Demonstrate Time: & Counter		programming with 8051 microcontrolle
		IUNE	15	programming with 8051 microcontroller	b. S. m	
		1964	18			
		8051 SHAND COLLEGE ESTD JUNE 1964	131			

SEC-2 PCB (Printed circuit board) Designing and fabrication CO2: Create and design PCB CO2: Create and design PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit	COA: Demonstrate
SEC-1 Electronic Circuit design and Simulation using Proteus CO1: Familiar with Proteus Simulation Software CO2: Design circuit schematics CO3: Simulate and analyze Analog circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and enalyze Digital circuits CO4: Sim	CO4: Demonstrate serial & Interrup
Circuit design and Simulation using Proteus Software CO2: Design circuit schematics CO3: Simulate and analyze Analog circuits CO4: Simulate and analyze Digital circuit schematics CO3: Simulate and analyze Digital circuit schematics CO4: Simulate and analyze Digital circuit schematics CO5: Design circuit schematics CO6: Design circuit schematics CO7: Designid circuit schematics CO7: Understand fundamentals of PCB CO7: Designid circuit schematics CO7: Understand fundamentals of PCB CO7: Designid circuit schematics CO7: Understand fundamentals of PCB CO7: Designid circuit schematics CO7: Understand fundamentals of PCB CO7: Understand fundamentals of PCB CO7: Understand the fundamentals of measurements CO7: understand the fundamentals of nessurement and performance characteristics of instruments CO7: understand the fundamentals of nessurement and performance characteristics of instrum	programming with 8051 microcontrolle
and Simulation using Proteus CO2: Design circuit schematics CO3: Simulate and analyze Analog circuits CO4: Simulate and analyze Digital circuits CO5: Develop PCB CO6: Co7: Create and design PCB CO6: Develop PCB CO7: Develop PCB CO7	CO1: Familiar with Proteus Simulation
using Proteus CO3: Simulate and analyze Analog circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and analyze Digital circuits CO4: Simulate and analyze Digital circuits CO5: Design and fabrication CO5: Design PCB CO6: Understand fundamentals of PCB CO3: Develop PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO2: apply fundamental knowledge of Instruments CO3: understand the fundamentals of measurements CO3: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators principles and types of actuators CO4: understand the concepts, principles and types of actuators CO5: Design PCB CO6: CO6: Understand fundamentals of PCB CO7: Design PCB CO6: Understand fundamentals of PCB CO7: Design PCB CO6: Understand fundamentals of PCB CO7: Design PCB CO7: Design PCB CO7: Design PCB CO7: Design PCB CO7: Understand fundamentals of PCB CO7: Design PCB CO7: Design PCB CO7: Understand fundamentals of PCB CO7: Design PCB CO7: Understand the fundamentals of Design PCB CO7: Design PCB CO7: Design PCB CO7: Understand the fundamentals of Design PCB CO7: Understand the fundamentals of Design PCB CO7: Design PCB CO7: Design PCB CO7: Design PCB CO7: Understand the fundamentals of Design PCB CO7: Understand the fundamentals of Design PCB CO7: Design PCB CO7: Design PCB CO7: Understand the fundamentals of Design PCB CO7: Understand the fundamentals	
circuits CO4: Simulate and analyze Digital circuits CO5: Simulate and analyze Digital circuits CO6: Understand fundamentals of PCB CO2: Create and design PCB CO2: Co3: Develop PCB CO4: Etch the PCB and assemble the circuit CO4: Etch the PCB and assemble the circuit CO4: Simulate and analyze Digital circuits CO6: Understand fundamentals of PCB CO2: Create and design PCB CO2: Create and design PCB CO2: Co4: Etch the PCB and assemble the circuit CO4: Develop PCB CO3: Develop PCB CO3: Develop PCB CO3: Develop PCB CO4: Develop PCB CO5: Develop PCB CO5: Develop PCB CO5: Develop PCB CO6: Develo	CO2: Design circuit schematics
24 SEC-2 PCB (Printed circuit board) Designing and fabrication 25 DSE 1005E1 DSE 1005E1 DSE 1005E2 Antenna and 2023-24 DSE 27 DSE 1005E2 DSE 1005E2 Antenna and 2023-24 DSE 27 DSE 1005E2 PCB (Printed circuit board) Designing and fabrication CO1: Understand fundamentals of PCB CO2: Create and design PCB CO3: Develop PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit circuit CO1: Understand fundamentals of CO2: Create and design PCB CO3: Develop PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO1: understand design PCB CO3: Develop PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO1: understand the fundamentals of measurements and performance characteristics of instruments CO2: apply fundamental knowledge of Instrument for electrical measurements CO3: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators CO1: program 8051microcontroller using Embedded C CO2: interface and control various input and output devices using microcontrollers CO3: understand and implement ADC and DAC interfacing techniques effectively CO4: interface various sensors to 8051microcontroller CO4: understand the fundamentals of concepts, principles and types of actuators CO6: understand and implement ADC and DAC interfacing techniques effectively CO4: interface various sensors to 8051microcontroller CO3: understand and implement ADC and DAC interfacing techniques effectively CO4: interface various sensors to 8051microcontroller CO1: understand the fundamentals of 2023-24 CO1: understand the fundamentals of 2021-24 CO2: interface and control various input and output devices using microcontroller using Embedded C CO2: interface various sensors to 8051microcontroller CO3: understand the fundamentals of 2021-24 CO4: understand the fundamentals of 2021-24 CO5: understand the fundamentals of 2021-24 CO6: understand the fundamentals of 2021-24 CO7: understand the f	CO3: Simulate and analyze Analo
24 SEC-2 PCB (Printed circuit board) Designing and fabrication 25 DSE 1005E1 26 DSE 1005E2 27 DSE 1005E2 28 SEC-2 28 SEC-2 29 DSE 1005E2 20 DSE 1005E	circuits
SEC-2 PCB (Printed circuit board) Designing and fabrication Designing and fabrication CO3: Develop PCB CO3: Develop PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit Etch the PCB and assemble the circuit Etch the PCB and assemble the circuit CO4: Etch the PCB and assemble the circuit Etch the PCB and assemble the circuit CO4: Etch the PCB and assemble the circuit Etch the PCB and assemble the circuit Etch the PCB and assemble the circuit CO4: Etch the PCB and assemble the circuit Etch the PCB and assemble the cir	CO4: Simulate and analyze Digit
circuit board) Designing and fabrication CO2: Create and design PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO2: Create and design PCB CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO3: Develop PCB CO4: Etch the PCB and assemble the circuit CO4: Etch the PCB and assemble the circuit CO5: Understand the fundamentals of measurement and performance characteristics of instruments CO2: apply fundamental knowledge of Instrument for electrical measurements CO3: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators CO3: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO6: understa	circuits
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DSE 1005E1 Fundamentals of 1005E1 Fundamentals of Instrumentation 2023-24 CO1: understand the fundamentals of measurement and performance characteristics of instruments CO2: apply fundamental knowledge of Instrument for electrical measurements CO3: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators CO4: understand the principles and selection criteria of transducers in various engineering applications. CO4: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the principles and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO5: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO7: under	CO2: Create and design PCB
DSE 1005E1 Fundamentals of Instrumentation Secondard Colimer Colime	CO3: Develop PCB
DSE 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E1 Fundamentals of 1005E2 Fundamental knowledge of Instruments CO2: apply fundamental knowledge of Instrument 6r electrical measurements CO2: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO4: understand the 2004: understand and inplement ADC and output devices using microcontroller using Embedded C CO2: interface and control various input and output devices using microcontroller and output devices usi	CO4: Etch the PCB and assemble the
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characteristics of instruments CO2: apply fundamental knowledge of Instrument for electrical measurements CO3: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators 26 DSE 1005E2 Microcontroller Interfacing Microcontroller using Embedded C CO2: interface and control various input and output devices using microcontrollers CO3: understand and implement ADC and DAC interfacing techniques effectively CO4: interface various sensors to 8051microcontroller 27 DSE Antenna and 2023-24 CO1: understand the fundamentals of antenna theory. CO2: apply fundamental knowledge of Instruments CO2: apply fundamental knowledge of Instrument for electrical measurements CO3: understand the principles, types, and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators CO4: understand the concepts, principles and types of actuators CO5: understand the concepts, principles and types of actuators CO6: understand the concepts, principles and types of actuators CO7: understand the concepts, principles and types of actuators CO8: understand and implement ADC and output devices using microcontrollers CO9: understand and implement ADC and DAC interfacing techniques effectively CO4: interface various sensors to 8051microcontroller CO1: understand and implement ADC and DAC interface various sensors to 8051microcontroller	CO1: understand the fundamentals of
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and selection criteria of transducers in various engineering applications. CO4: understand the concepts, principles and types of actuators DSE 1005E2	CO3: understand the principles, types
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DSE 1005E2 Microcontroller Using Embedded C CO2: interface and control various input and output devices using microcontrollers CO3: understand and implement ADC and DAC interface various sensors to 8051microcontroller 27 DSE Antenna and 2023-24 CO1: program 8051microcontroller using Embedded C CO2: interface and control various input and output devices using microcontrollers CO3: understand and implement ADC and DAC interfacing techniques effectively cO4: interface various sensors to 8051microcontroller 27 DSE Antenna and 2023-24 CO1: understand the fundamentals of antenna theory.	CO4: understand the concepts
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8051microcontroller 8051microcontroller 27 DSE Antenna and 2023-24 CO1: understand the fundamentals of cO1: understand the fundamentals of antenna theory.	effectively
8051microcontroller 8051microcontroller 27 DSE Antenna and 2023-24 CO1: understand the fundamentals of CO1: understand the fundamentals of antenna theory.	CO4: interface various sensors to
27 DSE Antenna and 2023-24 CO1: understand the fundamentals of CO1: understand the fundamentals of	8051microcontroller
1005E2 Wave antenna theory	CO1: understand the fundamentals o
Propagation CO2: get familiarize with different CO2: get familiarize with different parameters of antenna	antenna theory
parameters of antenna parameters of antenna	CO2: get familiarize with differen
parameters of anterina	parameters of antenna
CO3: get familiarize with application of CO3: get familiarize with application of	CO3: get familiarize with application o
antenna according to types of antenna antenna according to types of antenna	antenna according to types of antenna
	×
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				CO4: create awareness about the different types of propagation of radio waves at different frequencies	CO4: create awareness about the different types of propagation of radio waves at different frequencies	CO4: create awareness about the different types of propagation of radio waves at different frequencies
28	DSE 1005E4	Industrial Process Control	2023-24	CO1: understand the basics of control system CO2: understand the different types of controllers CO3: describe typical concepts and components of a Programmable Logic Controller CO4: understand Ladder programming and design basic PLC circuits for entry-	CO1: understand the basics of control system CO2: understand the different types of controllers CO3: describe typical concepts and components of a Programmable Logic Controller CO4: understand Ladder programming and design basic PLC circuits for entry-	CO1: understand the basics of control system CO2: understand the different types of controllers CO3: describe typical concepts and components of a Programmable Logic Controller CO4: understand Ladder programming and design basic PLC circuits for entry-level PLC applications
29	SEC- 3	Computer Network	2023-24	level PLC applications CO1: know the fundamentals of computer networks CO2: get familiarize with different public switched telephone networks CO3: apply knowledge of transmission media, multiplexing and telephone networks CO4: design and analyse the computer network protocols	level PLC applications CO1: know the fundamentals of computer networks CO2: get familiarize with different public switched telephone networks CO3: apply knowledge of transmission media, multiplexing and telephone networks CO4: design and analyse the computer network protocols	CO1: know the fundamentals of computer networks CO2: get familiarize with different public switched telephone networks CO3: apply knowledge of transmission media, multiplexing and telephone networks CO4: design and analyse the computer network protocols
30	DSE 1005F1	Industrial Instrumentation	2023-24	CO1: design and study different OP-AMP circuits CO2: design and implement active filter circuits CO3: distinguish analog and digital instruments CO4: design and implement VCO, V to F and V to F converter using different ICs	circuits CO3: distinguish analog and digital instruments CO4: design and implement VCO, V to F and V to F converter using different ICs	AMP circuits CO2: design and implement active filter circuits CO3: distinguish analog and digital instruments CO4: design and implement VCO, V to
31	DSE 1005F2	Advanced Microcontroller ESTD JUNE 1964	2023-24	CO1: understand the architecture and function of each pin of AVR 8-bit Microcontroller CO2: write, debug and simulate embedded C language programs CO3: understand Timer operation, Interrupt environment and Serial Communication CO4: understand the interfacing of	function of each pin of AVR 8-bit Microcontroller CO2: write, debug and simulate embedded C language programs CO3: understand Timer operation,	function of each pin of AVR 8-bit Microcontroller CO2: write, debug and simulate embedded C language programs CO3: understand Timer operation, Interrupt environment and Serial Communication

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	البعيدان			various systems with AVR microcontroller	various systems with AVR	various systems with AVR
32	DSE	Power	2023-24		microcontroller	microcontroller
	1005F3	Electronics,	= 1	CO1: understand basic power electronic devices and their role in power	CO1: understand basic power electronic	CO1: understand basic power electronic
				conversion role in power		devices and their role in power conversion
	311	540 I		CO21	conversion CO2: understand the types,	000
				characteristics, and applications of	characteristics, and applications of	characteristics, and applications of
				Thyristors and applications of	Thyristors	Thyristors
				CO3: understand and analyse	CO3: understand and analyse	CO3: understand and analyse
				performance of controlled and	performance of controlled and	performance of controlled and
		110		uncontrolled converters.	uncontrolled converters.	uncontrolled converters.
				CO4: understand working principles of	CO4: understand working principles of	CO4: understand working principles d
22	DOE			Power Systems	Power Systems	Power Systems
33	DSE	Internet of	2023-24	CO1: gain knowledge about the	CO1: gain knowledge about the	CO1: gain knowledge about the
	1005F4	Things(IoT)		architecture of IoT systems	architecture of IoT systems	architecture of IoT systems
				CO2: study the working principle of	CO2: study the working principle of	CO2: study the working principle of
				various types of sensors and actuators	various types of sensors and actuators	various types of sensors and actuators
		=	100	used in IoT applications	used in IoT applications	used in IoT applications
		120		CO3: explore wireless technologies for	CO3: explore wireless technologies for	CO3: explore wireless technologies for
				IoT and gain an overview of different IoT protocols	IoT and gain an overview of different	IoT and gain an overview of different
				CO4: explore cloud platforms used in	IoT protocols CO4: explore cloud platforms used in	IoT protocols
			150	IoT, including IoT dashboards and	IoT, including IoT dashboards and	CO4: explore cloud platforms used in IoT, including IoT dashboards and
1			-	various cloud service	various cloud service	various cloud service
				providers	providers	providers
34	SEC-4	Embedded	2023-24	CO1: familiarize with Arduino Board &	CO1: familiarize with Arduino Board &	CO1: familiarize with Arduino Board &
		System Design		Accessories	Accessories	Accessories
	į.	using Arduino		CO2: familiarize with Arduino software	CO2: familiarize with Arduino software	CO2: familiarize with Arduino software
				development environment	development environment	development environment
	1			CO3: interface the output devices LED,	CO3: interface the output devices LED,	CO3: interface the output devices LED,
				LCD with Arduino	LCD with Arduino	LCD with Arduino
				CO4: interface the different types of	CO4: interface the different types of	CO4: interface the different types of
25	DOGGOODY E	13717.00	2022 24	sensors with Arduino	sensors with Arduino	sensors with Arduino
35	DSC03ELE		2023-24	components and determine the value of	CO1: Identify and explain electrical	CO1: Identify and explain electrical
	11	ELECTRONICS	1	components and determine the value of resistor, inductor and capacitor using	components and determine the value of	components and determine the value of
		-1		color code method.	resistor, inductor and capacitor using color code method.	resistor, inductor and capacitor using
	1_	NO COLLEGE TO		CO2: Understand the basic properties of	CO2: Understand the basic properties of	color code method.
		TOTO E	\	electrical elements, and solve DC circuit	electrical elements, and solve DC	CO2: Understand the basic properties of electrical elements, and solve DC
		ESID /	1	analysis problems, DC network	circuit analysis problems, DC network	circuit analysis problems, DC network
		ESTD JUNE 1964		theorems.	theorems.	theorems.
		Criticowered Autonomos	7			movi onio.
		Towers Autonomy				
		LIEG MU		A STATE OF THE PARTY OF THE PAR		

1				CO3: Acquire the knowledge about the	CO3: Acquire the knowledge about the	CO3: Acquire the knowledge about the
				characteristics and working principles	characteristics and working principles	characteristics and working principles
				of PN junction diode, Zener diode,	of PN junction diode, Zener diode,	of PN junction diode, Zener diode,
1				photo diode, LED and different diode	photo diode, LED and different diode	photo diode, LED and different diode
1				applications.	applications.	applications.
				CO4: Understanding and study of	CO4: Understanding and study of	CO4: Understanding and study of
1				rectifier, filter and voltage regulator	rectifier, filter and voltage regulator	rectifier, filter and voltage regulator
26	DECOSELE	210-11		circuits.	circuits.	circuits.
36	DSC03ELE	DIGITAL	2023-24	CO1: Understanding the basics of	CO1: Understanding the basics of	CO1: Understanding the basics of
	12	ELECTRONICS		Digital Electronics, different number	Digital Electronics, different number	Digital Electronics, different number
i		I-1		systems, Binary Codes and signed	systems, Binary Codes and signed	systems, Binary Codes and signed
				representation of binary number. Also	representation of binary number. Also	representation of binary number. Also
1				understand the conversion between	understand the conversion between	understand the conversion between
1				different number systems and solve the	different number systems and solve the	different number systems and solve the
				binary arithmetic problems.	binary arithmetic problems.	binary arithmetic problems.
			1	CO2: Design and construction of the	CO2: Design and construction of the	CO2: Design and construction of the
				basic and universal logic gates and	basic and universal logic gates and	basic and universal logic gates and
				studying the Boolean algebra and	studying the Boolean algebra and	studying the Boolean algebra and
				simplification of Boolean expression	simplification of Boolean expression	simplification of Boolean expression
	1			using different methods.	using different methods.	using different methods.
				CO3: Understanding and comparing	CO3: Understanding and comparing	CO3: Understanding and comparing
				different logic families according IC	different logic families according IC	different logic families according IC
				specifications and their circuit	specifications and their circuit	specifications and their circuit
				configurations.	configurations.	configurations.
				CO4: Understand, analyze and design		CO4: Understand, analyze and design
				various combinational circuits.	various combinational circuits.	various combinational circuits.
37	DSC03ELE	ANALOG	2023-24	CO1: Analyze output in different	CO1: Analyze output in different	CO1: Analyze output in different
	21	ELECTRONICS		operating modes of Bipolar Junction	operating modes of Bipolar Junction	operating modes of Bipolar Junction
		-II		Transistor and Demonstrate the	Transistor and Demonstrate the	Transistor and Demonstrate the
				operating principle and output	operating principle and output	operating principle and output
				characteristics of Bipolar Junction	characteristics of Bipolar Junction	characteristics of Bipolar Junction
1				Transistor	Transistor	Transistor
				CO2: Explain construction and		
				characteristics of JFETs, MOSFETs and	characteristics of JFETs, MOSFETs and	characteristics of JFETs, MOSFETs and
		COLLEGE		UJT.	UJT.	UJT.
1		THE OFF		CO3: Design biasing circuits for BJT	CO3: Design biasing circuits for BJT	CO3: Design biasing circuits for BJT
	1	S/ ESTD \3	2	and study different coupling methods	and study different coupling methods	and study different coupling methods
		I JUNE	0	used in multistage amplifiers	used in multistage amplifiers	used in multistage amplifiers
	1	1964 /	1	CO4: Analyze the importance of	CO4: Analyze the importance of	CO4: Analyze the importance of
		THE MED		feedback in amplifiers. Apply the	feedback in amplifiers. Apply the	feedback in amplifiers. Apply the
		ESTD JUNE 1964		knowledge gained in the design of	knowledge gained in the design of	knowledge gained in the design of
				<u> </u>		

20	DO COARL E	DIGITAL		transistorized circuits and Oscillators.	transistorized circuits and Oscillators.	transistorized circuits and Oscillators.
38	DSC03ELE 22	DIGITAL ELECTRONICS -II	2023-24	CO1: Understand, analyze and design various sequential circuits. CO2: Understanding the working of different shift registers and counters. CO3: Became able to know various types of analog to digital converters and digital to analog converters. CO4: Explain and compare the working of multivibrators using special application IC 555. Understanding and designing of multivibrator circuits.	CO1: Understand, analyze and design various sequential circuits. CO2: Understanding the working of different shift registers and counters. CO3: Became able to know various types of analog to digital converters and digital to analog converters. CO4: Explain and compare the working of multivibrators using special application IC 555. Understanding and designing of multivibrator circuits.	different shift registers and counters. CO3: Became able to know various
39	MIN03ELE 11	ANALOG ELECTRONICS -I	2023-24	CO1: Identify and explain electrical components and determine the value of resistor, inductor and capacitor using color code method. CO2: Understand the basic properties of electrical elements, and solve DC circuit analysis problems, DC network theorems. CO3: Acquire the knowledge about the characteristics and working principles of PN junction diode, Zener diode, photo diode, LED and different diode applications. CO4: Understanding and study of rectifier, filter and voltage regulator circuits.	CO1: Identify and explain electrical components and determine the value of resistor, inductor and capacitor using color code method. CO2: Understand the basic properties of electrical elements, and solve DC circuit analysis problems, DC network theorems. CO3: Acquire the knowledge about the characteristics and working principles of PN junction diode, Zener diode, photo diode, LED and different diode applications. CO4: Understanding and study of rectifier, filter and voltage regulator circuits.	CO1: Identify and explain electrical components and determine the value of resistor, inductor and capacitor using color code method. CO2: Understand the basic properties of electrical elements, and solve DC circuit analysis problems, DC network theorems. CO3: Acquire the knowledge about the characteristics and working principles of PN junction diode, Zener diode, photo diode, LED and different diode applications. CO4: Understanding and study of rectifier, filter and voltage regulator circuits.
40	MIN03ELE	DIGITAL ELECTRONICS -I COLLEGE FOLL ESTD JUNE 1964	2023-24		understand the conversion between different number systems and solve the binary arithmetic problems. CO2: Design and construction of the basic and universal logic gates and studying the Boolean algebra and	CO1: Understanding the basics of Digital Electronics, different number systems, Binary Codes and signed representation of binary number. Also understand the conversion between different number systems and solve the binary arithmetic problems. CO2: Design and construction of the basic and universal logic gates and studying the Boolean algebra and simplification of Boolean expression

1 1	1			using different methods.	using different methods.	using different methods.
1 1				CO3: Understanding and comparing	CO3: Understanding and comparing	CO3: Understanding and comparing
1 1				different logic families according IC	different logic families according IC	different logic families according IC
				specifications and their circuit	specifications and their circuit	specifications and their circuit
1 1				configurations.	configurations.	configurations.
				CO4: Understand, analyze and design	CO4: Understand, analyze and design	CO4: Understand, analyze and design
41) (Disapre			various combinational circuits.	various combinational circuits.	various combinational circuits.
41	MIN03ELE	ANALOG	2023-24	CO1: Analyze output in different	CO1: Analyze output in different	CO1: Analyze output in different
	21	ELECTRONICS		operating modes of Bipolar Junction	operating modes of Bipolar Junction	operating modes of Bipolar Junction
1		-II		Transistor and Demonstrate the	Transistor and Demonstrate the	Transistor and Demonstrate the
				operating principle and output	operating principle and output	operating principle and output
				characteristics of Bipolar Junction	characteristics of Bipolar Junction	characteristics of Bipolar Junction
				Transistor	Transistor	Transistor
				CO2: Explain construction and	CO2: Explain construction and	CO2: Explain construction and
				characteristics of JFETs, MOSFETs and	characteristics of JFETs, MOSFETs and	characteristics of JFETs, MOSFETs and
				UJT.	UJT.	UJT.
				CO3: Design biasing circuits for BJT	CO3: Design biasing circuits for BJT	CO3: Design biasing circuits for BJT
				and study different coupling methods	and study different coupling methods	and study different coupling methods
				used in multistage amplifiers	used in multistage amplifiers	used in multistage amplifiers
1				CO4: Analyze the importance of	CO4: Analyze the importance of	CO4: Analyze the importance of
				feedback in amplifiers. Apply the	feedback in amplifiers. Apply the	feedback in amplifiers. Apply the
				knowledge gained in the design of	knowledge gained in the design of	knowledge gained in the design of
12) (D) (O) ET E	DICITAL	2022.24	transistorized circuits and Oscillators.	transistorized circuits and Oscillators.	transistorized circuits and Oscillators.
42	MIN03ELE	DIGITAL	2023-24	CO1: Understand, analyze and design	CO1: Understand, analyze and design	CO1: Understand, analyze and design
	22	ELECTRONICS		various sequential circuits.	various sequential circuits.	various sequential circuits.
1		-П		CO2: Understanding the working of	CO2: Understanding the working of	CO2: Understanding the working of
				different shift registers and counters.	different shift registers and counters.	different shift registers and counters.
1		COLLEGE		CO3: Became able to know various	CO3: Became able to know various	CO3: Became able to know various
1		True	E	types of analog to digital converters and	types of analog to digital converters and	types of analog to digital converters and
		ESTD	12	digital to analog converters. CO4: Explain and compare the working	digital to analog converters. CO4: Explain and compare the working	digital to analog converters. CO4: Explain and compare the working
		JUNE	5	of multivibrators using special		
		1964	15/	application IC 555.	of multivibrators using special application IC 555.	of multivibrators using special application IC 555.
		(A)	0	Understanding and designing of		Understanding and designing of
		ESTD JUNE 1964		multivibrator circuits.	multivibrator circuits.	multivibrator circuits.
43	OEC03EL	CIRCUIT	2023-24	CO1: Understand the fundamental		
73	EII	FUNDAMENT	2023-24	concepts of electricity	concepts of electricity	concepts of electricity
	LII	ALS-I			CO2: Analyze DC resistive circuits	
1		11001			involving series and parallel	
				combinations of resistances	combinations of resistances	combinations of resistances
					CO3: Understand Kirchhoff's laws,	
	L			COS. CHOSTOMIC TEMPORED THEO,	Tendinoit o iumo,	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

ľ				network theorems,	network theorems,	network theorems,
44	OEC03EL	SEMICONDUC	2022.24	CO4: Understand AC fundamentals	CO4: Understand AC fundamentals	CO4: Understand AC fundamentals
77	E12	TOR	2023-24	CO1: Understand the principles of	CO1: Understand the principles of	CO1: Understand the principles of
	LIZ	DEVICES-I		semiconductors,	semiconductors,	semiconductors,
		DEVICES-I		CO2: Understand the construction,	CO2: Understand the construction,	CO2: Understand the construction,
				characteristic and working of PN	characteristic and working of PN	characteristic and working of PN
				junction diodes,	junction diodes,	junction diodes,
				CO3: Understand the construction,	CO3: Understand the construction,	CO3: Understand the construction,
1				working principles and IV	working principles and IV	working principles and IV
				characteristics of special purpose	characteristics of special purpose	characteristics of special purpose
				diodes	diodes	diodes
				CO4: Understand the construction,	CO4: Understand the construction,	CO4: Understand the construction,
				working principles and working of	working principles and working of	working principles and working of
45	OFCORF	OUD OF UT		bipolar junction transistor (BJT)	bipolar junction transistor (BJT)	bipolar junction transistor (BJT)
45	OEC03EL	CIRCUIT	2023-24	CO1: Understand the specifications,	CO1: Understand the specifications,	CO1: Understand the specifications,
	E21	FUNDAMENT		classification, construction, and	classification, construction, and	classification, construction, and
		ALS-II		applications of passive circuit elements	applications of passive circuit elements	applications of passive circuit elements
				CO2: Understand the concepts,	CO2: Understand the concepts,	CO2: Understand the concepts,
				construction, and types of passive	construction, and types of passive	construction, and types of passive
				circuit elements	circuit elements	circuit elements
1				CO3: Understand the principles, types,	CO3: Understand the principles, types,	CO3: Understand the principles, types,
1				and operation of circuit control and	and operation of circuit control and protective devices, including switches,	and operation of circuit control and protective devices, including switches,
				protective devices, including switches,	fuses, circuit breakers, and relays.	fuses, circuit breakers, and relays.
1				fuses, circuit breakers, and relays.	CO4: Understand the principles, types,	CO4: Understand the principles, types,
				CO4: Understand the principles, types, and characteristics of voltage and	and characteristics of voltage and	and characteristics of voltage and
1					current sources	current sources
16	OEC03EL	SEMICONDUC	2023-24	CO1: Understand the concept of	CO1: Understand the concept of	
46	E22	TOR	2023-24	transistor biasing and different methods	transistor biasing and different methods	transistor biasing and different methods
	EZZ	DEVICES-II		of transistor biasing	of transistor biasing	of transistor biasing
		DEVICES-II		CO2: Study the construction, working	CO2: Study the construction, working	CO2: Study the construction, working
				principles, and I-V characteristics	principles, and I-V characteristics	principles, and I-V characteristics
				(output and transfer) of JFETs and	(output and transfer) of JFETs and	(output and transfer) JFETs and
				MOSFETs.	MOSFETs.	MOSFETs.
		01150		CO3: Explore the concept of Single	CO3: Explore the concept of Single	CO3: Explore the concept of Single
		AND COLLEGE HO		stage and multistage amplifiers	stage and multistage amplifiers	stage and multistage amplifiers
		S -CTD	(1)	CO4: Understand feedback amplifiers	CO4: Understand feedback amplifiers	CO4: Understand feedback amplifiers
1		ESTD	\g\	and oscillators	and oscillators	and oscillators
		JUNE 1064	121			(P.U)

Dr. C. B. Patil
HEAD
DEPARTMENT OF ELECTRONICS