# SRINIVAS UNIVERSITY INSTITUTE OF ENGINEERING AND TECHNOLOGY

## **UNIVERSITY VISION & MISSION**

### VISION

To be a trendsetter among universities and build students who emerge as leaders with competence, Conscience and compassion by empowering them with sound education and high standards of ethical and Professional behavior enabling them to build and promote a more humane, just and sustainable world for Future generations.

### MISSION

Our mission is to provide an exceptional learning environment where students can develop and enhance their leadership and teamwork skills, creative and intellectual powers and passion for learning by providing an uncompromising standard of excellence in teaching, embodying the spirit of excellence to educate the citizen -leaders of society with distinction.

## **INSTITUTIONAL VISION**

To impart state of the art technical education by providing conducive learning environment for technological innovation, to inculcate research culture and skills necessary to meet the changing needs of the industry and the society in the field of Engineering and allied disciplines

## **INSTITUTIONAL MISSION**

#### The Institute of Engineering & amp; Technology was established with the aim to

- Provide international standards in education and training
- Prepare graduates with Knowledge and Skills in the field of Engineering
- Deliver a distinctive, all round, excellence driven engineering education that will groom future generations of engineers and entrepreneurs.

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEO):**

#### Graduates will be

PEO1: Electronics and communication engineering professionals are qualified to seek careers in a variety of fields and higher education.

PEO2: Capable of coming up with original, technically sound, financially viable, and socially acceptable solutions to real-world issues.

PEO3: Capable of collaborating with others and adjusting to new technologies while Upholding moral principles.

#### **PROGRAM OUTCOME (PO):**

**PO1 Engineering Knowledge:** To apply knowledge of mathematics, science, engineering fundamentals, problem

Solving skills, algorithmic analysis to solve complex engineering problems.

**PO2 Problem analysis:** To analyze the problem by finding its domain and applying domain specific skills.

**PO3 Design/development of solutions:** To understand the design issues of the product/software and develop effective solutions with appropriate consideration of public health and safety, cultural, societal, and environmental issues.

**PO4 Conduct investigations of complex problems:** To find solutions of complex problems by conducting investigations applying Suitable techniques.

PO5 Modern tool usage: To adapt the usage of modern tools and recent software.

**PO6 The engineer and society**: To contribute towards the society by understanding the impact of Engineering on Global aspect.

**PO7 Environment and sustainability:** To understand environment issues and design a sustainable system.

PO8 Ethics: To understand and follow professional ethics.

**PO9 Individual and team work:** To function effectively as an individual and as member or leader in diverse teams And interdisciplinary settings.

PO10 Communication: To demonstrate effective communication at various levels.

**PO11 Project Management and finance:** To apply the knowledge of Computer Engineering for development of projects, and Its finance and management.

**PO12 Life-Long Learning:** To keep in touch with current technologies and inculcate the practices of lifelong Learning

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# **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

# **PROGRAMME SPECIFIC OUTCOMES (PSO):**

PSO1: Ability to apply electronics principles in various areas of analog and digital systems, as well as various modes of communication systems and signal processing.

PSO2: Ability to recognize, design, simulate, analyze, and create electronic circuits and systems using modern engineering tools and programming languages (hardware and hardware-software co-design).

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CO2	√	✓	✓	√	$\checkmark$	√			✓	✓	✓	✓
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CO2	√	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$			$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
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CO3	√	✓	✓	✓	$\checkmark$	√	✓	✓	✓	$\checkmark$	✓	✓
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CO2	✓	<ul> <li>✓</li> </ul>	✓	$\checkmark$	$\checkmark$	✓			$\checkmark$	✓	✓	$\checkmark$		
CO3	√	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
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CO3 CO4	✓ ✓	$\checkmark$	✓	√	√		✓	$\checkmark$	✓ √	√	$\checkmark$	✓ √
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CO2 CO3	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	<u>,</u>		✓ ✓	✓ ✓	✓ ✓	✓ ✓
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CO3	•		✓ v	√ √	<ul> <li>✓</li> </ul>		$\checkmark$	✓	✓	√	✓	✓				
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CO4	•		✓ <b>v</b>	✓	<ul> <li>✓</li> </ul>	· ✓		√	✓		· ·	· ·				
III			NET	WORK .	ANALY	<b>TSIS</b>		<ul> <li>course, the student should be able to</li> <li>Use network techniques, like node analysis and loop analysis, to write equations for large linear circuits.</li> <li>Apply the knowledge of basic circuit law to simplify the networks using network theorems.</li> <li>Analyze the resonating behavior of series and parallel circuits.</li> </ul>								
	PO1	PO	2 PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1	١		✓	✓	√	√		√	✓	$\checkmark$	✓	$\checkmark$				
CO2	١		✓ v	∕ √	<ul> <li>✓</li> </ul>	√			✓	✓	✓	$\checkmark$				
CO3	<u>،</u>		✓ v		$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$				
III		EL	ECTRIC	AL ANI EASUR			ICS				tion of th ould be a					
								•	gener syster Use o Voltr and O Analy differ circut	ralized m m. of Amme neter and CRO for yze and i rent signa	d Multim measurer nterpret al genera e generat	ent eters nent tor				
	PO1	PO		PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1	١	1	✓	<b>√</b>	<ul> <li>✓</li> </ul>	✓		$\checkmark$	✓	✓	✓	<ul> <li>✓</li> </ul>				
CO2	``		<ul> <li>✓</li> <li>✓</li> </ul>		<b>√</b>	<b>√</b>			✓	<u> </u>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>				
III		1	✓ <mark> </mark>	COMMU	JNICA'	TIONS	~		e, the str Unde Comi and N Topo Analy Netw Trans Apply Multi Tech	udent sho rrstand ba municati Vetwork logies. yze the d ork Mod smission y the diff plexing niques. E	lels and Media.	ching ection				

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u>√</u>	✓ ×	100	√	√	<u> </u>	107	✓ ×	<u>↓</u>	✓ ×	✓ V	✓ ×
CO2	√	<ul> <li>✓</li> </ul>	√	√	√	✓			✓	$\checkmark$	✓	$\checkmark$
CO3	✓	<ul> <li>✓</li> </ul>	✓	√	√	✓	√	✓	✓	$\checkmark$	$\checkmark$	$\checkmark$
III		Γ1	Γ INFR Δ Μ	ASTRU ANAGI					e, the stu Unde Infras block Analy Stora secur Apply demo	udent sho erstand th structure ts. yze the c ge block ity y concep onstrate th	of IT Bu ompute a s & stora	ble to: hilding and age r &
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	<ul> <li>✓</li> </ul>		√	√	✓		✓	✓	$\checkmark$	✓	$\checkmark$
CO2	✓	<ul> <li>✓</li> </ul>	✓	√	√	✓			✓	$\checkmark$	$\checkmark$	$\checkmark$
CO3	✓	✓	$\checkmark$	$\checkmark$	$\checkmark$	✓ RAMM	$\checkmark$	✓	✓	✓	$\checkmark$ tion of th	✓
								•	Expla File s comm Analy Progr const funda CO3: conce	ain Unix	ocess he writing	ture,
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	<ul> <li>✓</li> </ul>		$\checkmark$	$\checkmark$	✓		✓	~	✓	✓	✓
CO2	✓	<b>√</b>	<ul> <li>✓</li> </ul>	✓	<ul> <li>✓</li> </ul>	✓			✓	✓	<ul> <li>✓</li> </ul>	✓
III		TECH	✓ IT ENI INOLC IES		<u> </u>	<b>∕</b>	✓		✓ ubject v Acader		▲ Andled by	✓ √ IBM
III	]	PLOYAI		SKILI OGRA			MENT	studen • U of • U of	nts are a ndersta f QUAN ndersta	nd the ba NTITATI nd the ba	course, asic conc IVE ABI asic conc ASONIN	LITY epts

								CC R So a Q Q R · L k i · C e y G	earn do nowledg ompete cars and a cars a compete cars lil	VING npus pla papers co ive Abili- g and Ve main spe ge in variou ce CAT, GRE, GA	e of VEF cements overing ity, Logic erbal Abi ecific us compe	cal lity etitive
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓	✓		~	$\checkmark$
CO2	$\checkmark$	✓	✓	$\checkmark$	$\checkmark$		$\checkmark$		$\checkmark$	$\checkmark$	✓	$\checkmark$
CO3	✓	✓	✓	✓	✓		$\checkmark$	$\checkmark$	✓	✓	✓	✓
CO4	✓	✓				✓			✓		<ul> <li>✓</li> </ul>	✓
CO5	✓	✓ ✓	✓	✓	✓	✓		✓	✓		✓ ✓	✓
CO6 III	✓		✓ RNATI			✓ FICAT	✓ ION	✓	<b>√</b>	$\sim$ on of this	$\checkmark$	~
								•	devel Acqu Beco Have	opment ire new s me Indus more co	e on the skills stry ready nfidence l knowlee	ý
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	~	<ul> <li>✓</li> </ul>	✓	✓	✓	~	✓	$\checkmark$	~		✓	✓
CO2	✓	✓	~	~	✓		<ul> <li>✓</li> </ul>		✓	✓	<ul> <li>✓</li> </ul>	✓
CO3	✓	✓ ✓	✓	✓	✓		✓	✓	✓	✓	✓ ✓	✓
CO4	✓ √	✓ ✓				• •			✓ √		$\checkmark$	V
III		•	IN	<u> </u>	¥ SHIP -1				e able to Remo essen proce of the prese orien sessio Appl from real-v the or	b: ember an tial polic edures, an e organiz nted duri tation an ons. y the kno their cou world pro rganizatio	urse, stud d list the cies, nd guidel ation as	ines g gained to hin tively

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	• PO8	field Critic contr orgar evalu durin propo	of study, cally ibutions nization's nate the c ng their ose rec	assess to hallenge internshi commeno nprovem	their the goals, s faced p, and dations
CO1	r01 ✓	$\frac{102}{\checkmark}$	103	<u>r0</u> 4 ✓	r05 ✓	F00 ✓	r0/	r08 ✓	F09 √	r010 ✓	r0∏ √	F012 ✓
CO2	~	√	✓	~	√	√			√	√	✓	✓
CO3	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
IV	Μ	IATHE	EMATIO			<b>FISTIC</b>	S FOR				tion of th	
			E	ENGIN	EERS				-		ould be a	ble to:
								•		onstrate rstanding	g of vect	or
									space	es, linear	indepen	dence,
											ik, and a	
											ts to solv	
								•	-		pings and	
									unde	rstand th	e relation	nship
											s change	,
									-	ge, and ke	ernel. ms, innei	-
								•			gths, and	
											ector spa	
											ese meas	ures to
									analy vecto	ze and c	compare	
								•			apply the	
										epts of a		
											, orthono	ormal
										, and ort		
										ections in mpositio		
								•	Calc	ulate gra	dients of	
									and v	vector-va	lued fun	ctions,
											m to solv	
									-		problems ehavior o	
									funct			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓	~	✓	√	√	✓	$\checkmark$	√		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2	~	<u> </u>	~	✓	$\checkmark$		<ul> <li>✓</li> </ul>		$\checkmark$	✓ ✓	$\checkmark$	
CO3	✓ ✓	$\frac{\checkmark}{\checkmark}$	✓	✓	$\checkmark$		✓	✓	✓ ✓	✓	✓ ✓	✓ 
CO4 CO5	✓ ✓	• √	$\checkmark$		<u></u>	✓ ✓		✓	✓ ✓		✓ ✓	× 
	v	v	v	v	v	V		v	v		v	<b>v</b>

IV	EN	ABEDD	ED SY:	STEM ]	DESIG	N		<b>.</b>	on of this	course,	
							studer • •	evalu Micro Arch set of Von- CPU Enlig betwo Micro Arch Micro Interf exter Instru Reco set of Unde hardy their on th attrib syste Desig	und the l aation of oprocess itecture a f 8086, C Neuman Architec then the een Micr ocontroll itecture of ocontroll facing of nal mem action set gnize the f 8051. erstand th ware com selection e charact utes of a m. gn and de g RTOS,	and instru ISC & R n & Harv cture. difference oprocess ers, of 8051 er, and 8051 to ory and t of 8051 e Instruct	iction ISC, /ard ce ors & ors & ion and based ind ded odules nt
PC	D1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		- √	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	✓
CO1	$\checkmark$ $\checkmark$	· ✓	✓	$\checkmark$		$\checkmark$		✓	$\checkmark$		$\checkmark$
CO1 CO2 CO3			✓ ✓	✓ ✓		✓ ✓	✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
CO2			✓ ✓	✓ ✓		✓ ✓	✓	$\checkmark$		✓	✓ ✓ ✓
CO2 CO3 CO4 CO5				✓ ✓	✓ ✓	✓ ✓	✓ ✓	$\checkmark$	✓	✓ ✓ ✓ ✓	
CO2 CO3 CO4		COMPU	UTER N	✓ ✓	✓ ✓ ORKS	✓ ✓			✓ the cour	✓	✓ ✓ ✓ udent
CO2 CO3 CO4 CO5			V V UTER N	✓ ✓	✓ ✓ ORKS	✓ ✓		e able to Unde	the cour o: erstand th	$ \begin{array}{c} \checkmark \\ \checkmark \\ \checkmark \\ \checkmark \\ \hline \\ \checkmark \\ \hline \\ \text{se, the st} \\ \text{ne fundar} \end{array} $	
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ ORKS		will be	e able to Unde conc	the cour o: erstand the pts of co	✓ ✓ ✓ ✓ se, the st me fundar omputer	nental
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ ORKS		will be	e able to Unde conc netw netw	the cour o: erstand th epts of co orks by e ork archi	✓ ✓ ✓ ✓ se, the st ne fundar omputer explainin itectures,	nental g
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ ORKS	✓ ✓	will be	e able to Unde conc netw netw proto	the cour o: erstand the epts of co orks by e ork archio cols, and	✓ ✓ ✓ ✓ se, the st me fundar omputer explainin itectures,	nental g
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ ORKS		will be	e able to Unde conc netw netw proto com	the cour o: erstand the pts of co orks by e ork archi ocols, and nunicatio	✓ ✓ ✓ ✓ se, the st ne fundar omputer explainin itectures,	nental g s.
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ DRKS		will be	e able to Unde conc netw netw proto com Appl prino	the cour o: erstand th epts of co orks by e ork archi ocols, and nunicatio y compu	✓ ✓ ✓ ✓ se, the st me fundar omputer explainin itectures, 1 on model oter netwo design,	nental g s. orking
CO2 CO3 CO4 CO5			UTER N	✓ ✓	√ √ ORKS		will be	e able to Unde conc netw netw proto com Appl prino confi	the cour o: erstand the epts of co orks by e ork archi ocols, and nunication y compu- ciples to o igure, and	✓ ✓ ✓ ✓ se, the st me fundar omputer explainin itectures, 1 on model iter netwo	nental g s. orking shoot
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ ORKS		will be	e able to Unde conc netw netw proto com Appl prino confi netw pract	the cour o: erstand the epts of co orks by e ork archi ocols, and munication y compu- siples to o igure, and ork setup ical skill	✓ ✓ ✓ ✓ se, the st me fundar omputer explainin itectures, 1 on model iter netwo design, d trouble os, showo s in netwo	nental g s. orking shoot casing
CO2 CO3 CO4 CO5			UTER N	✓ ✓	√ √ DRKS		will be	e able to Unde conc netw netw proto com Appl prino confi netw pract	the cour o: erstand the epts of co orks by e ork archi ocols, and nunication y compu- ciples to o gure, and ork setup ical skill guration	✓ ✓ ✓ ✓ ✓ se, the st me fundar omputer explainin itectures, 1 on model tter netwo design, d trouble os, showo s in netwo and	nental g s. orking shoot casing
CO2 CO3 CO4 CO5			UTER N	✓ ✓	✓ ✓ ORKS		will be	e able to Unde conc netw netw proto com Appl prino confi netw pract confi trout	the cour o: erstand the epts of co orks by e ork archio cols, and nunication y compu- siples to o agure, and ork setup ical skill guration oleshootin cally asse	✓ ✓ ✓ ✓ ✓ se, the st me fundar omputer explainin itectures, d on model iter netwo design, d trouble os, showo s in netwo and ng.	nental g orking shoot casing vork

CO1 CO2 CO3 IV	PO1		PO3	PO4 ✓ ✓ TEGRA	PO5	PO6	PO7 ✓ TS		meas cons effici com PO9 V V V mpletic nts are a Unde and p CMR Outp Slew Desig Inver Sum Amp Volta Desig Low Pass, Volta Op-A Unde	erstand O parameter R, PSRF ut Imped Rate. gn Op-Ar ting, Nor ning & I lifier, and lifiers ind age Follo gn first & Pass, Hig Band St age Regu	I scalabil s to ensu reliable con. PO11 ✓ ✓ Course, p-Amp construction course, p-Amp course, p-Amp	re lata PO12 ✓ ✓ ✓ ✓ Cricuit ing und d I ng, e order Band s and ing rigger
CO1 CO2 CO3	PO1 •	✓ ✓ ✓	PO3	PO4 ✓ ✓	PO5 ✓ ✓	PO6 ✓	PO7 ✓ ✓	PO8 ✓	PO9 ✓ ✓	PO10 ✓ ✓	PO11 ✓ ✓	PO12 ✓ ✓
CO4 CO5	v					✓ ✓		✓	✓ ✓		✓ ✓	✓ ✓
IV		INFORM	MATIO	N THE	ORY A	ND CC	DING	On su	e, the st Unde Depe Sour infor of In a sou Repr using Shan	l comple udent sho erstand c endent & ce, meas mation, l formatio formatio urce. esent the g Shanno non Fano man Enc	ould be a oncept of Indepen ure of Entropy, n and Or informa n Encodi o, Prefix	ble to: f dent Rate der of tion ing,

								•	Anal discr	rithms. yze the c ete comr nels usin oint.	nunicatio	on
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	✓		$\checkmark$	√	<ul> <li>✓</li> </ul>		✓	√	$\checkmark$	✓	✓
CO2	√	✓	✓	√	$\checkmark$	<ul> <li>✓</li> </ul>			√	✓	✓	✓
CO3	√	✓	✓	√	$\checkmark$	✓	✓	$\checkmark$	√	✓	✓	✓
IV		course, the student should be able to:         Classify the signals as continuous/discrete, periodic/aperiodic, even/odd, energy/power and deterministic/random signals.         Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems.         Compute the response of a Continuous and Discrete LTI system using convolution integral and convolution sum.         PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO11										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8				PO12
CO1	~	✓		✓	√	<ul> <li>✓</li> </ul>		$\checkmark$	√	$\checkmark$	✓	$\checkmark$
CO2	✓	√	✓	$\checkmark$	$\checkmark$	<ul> <li>✓</li> </ul>			√	$\checkmark$	✓	✓
CO3	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IV		OFTWA	KE EN	GINEE	KING				e, the st Unde conc engin softw cycle engin proce Appl princ deve syste pract requi desig techr Critic optim analy	l comple udent sho erstand th epts of so neering b vare deve e, require neering, a ess mode y softwa ciples to o lop, and ms, show ical skill rements gn pattern niques. cally asso nize softwa neering p vzing pro agement,	build be a ne fundar oftware by explain elopment and softw is. re engine design, test softw vcasing s in analysis, ns, and te ess and ware processes ject	ble to: mental ning life vare eering vare

									main to en relial	tenance sure effe ble softw	d softwar considera ctive and are outcome	ations l
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	✓		$\checkmark$	$\checkmark$	✓		✓	$\checkmark$	$\checkmark$	✓	$\checkmark$
CO2	√	✓	$\checkmark$	√	√	✓			√	✓	$\checkmark$	$\checkmark$
CO3	✓	<ul> <li>✓</li> </ul>	✓	√	√	✓	$\checkmark$	$\checkmark$	√	~	$\checkmark$	$\checkmark$
IV		D	ATA AI PR	NALY OGRA			ξ		e, the st Unde conc using expla mani and t Appl techr analy show in da data mode Critic com insig analy conc visua	udent she erstand the pts of d g R progra ining da pulation basic stat y R progra iques to v/casing p ta cleani analysis, eling. cally eva nunicate hts using v/zing pat lusions, a ulizing re ort inform	, visualiz istical an gramming perform visualizat ractical s ng, explo and stati luate and data-dri g R by terns, dra and effec	ble to: nental tics by ation, alysis. data tion, skills oratory stical l ven awing tively
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<b>√</b>	<ul> <li>✓</li> </ul>		✓	✓	<ul> <li>✓</li> </ul>		√	✓	<ul> <li>✓</li> </ul>	✓	✓
CO2	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	$\checkmark$	<b>√</b>	✓	<ul> <li>✓</li> </ul>			<b>√</b>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3 IV	✓ ✓	✓ NIFIED	MODE	✓ ELING	✓ LANG	✓ UAGE	$\checkmark$				$\checkmark$ tion of th	
								•	Unde conc Mod by ex types and r Appl mode softw show in cre diagr	erstand the epts of U eling Lan xplaining s, modelinotation. y UML to el and do vare syste casing p eating us cams, cla	nguage (l g diagram ng eleme technique cument ems, ractical s	mental UML) ents, es to skills ms,

		DOA	DOA	DO (	DOS		DOZ	•	optin analy diagr mode ensur repre syste	vzing mo cam cons eling too re clear a esentation ms.	L models deling ch istency, a l features and effect n of softw	noices, and s to tive ware
CO1	PO1	PO2	PO3	PO4	PO5 ✓	PO6	PO7	PO8 ✓	PO9	PO10 ✓	PO11 ✓	PO12
CO1			✓	 ✓	 ✓	· · · · · · · · · · · · · · · · · · ·		•	 ✓	· · · · · · · · · · · · · · · · · · ·	· ·	· · ·
CO3	,		$\checkmark$	√	√	✓	✓	✓	√	✓	✓	✓
IV			IS MY L ANI GODB	-					ubject v Acader		andled by	y IBM
IV	1	MINI PR	OJECT	WORK					e, the st Appl and s meth imple funct addre Prob Anal the n down into s and n deciss effic Eval of the meet solvi prob critic stren their poter	udent sho y progra software odologie ement, ar tional app esses a sp lem/Scer yze the r nini-projo n comple smaller c make info sions to e iency and uate the c eir Applii ing user ng the ta lem. The sally asse gths and	plication pecific hario. equirema ect, breal component ormed de ensure d usabilit effectivent cation in needs an rgeted by will also ess the limitation and prop s for	ble to: kills nent gn, that that ents of c ms nts, esign y. ness t d so ons of
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1 CO2			./	✓ ./	✓ ./	✓ 		✓	√ √	✓ ✓	$\checkmark$	✓ √
CO2 CO3			$\checkmark$	v _√	v _√	✓ ✓	√	✓	v _√	 ✓	✓ ✓	▼ ✓
IV		EMPLOY				ME 2	,	On co studer • U	nts are a ndersta	on of this ble to: nd the ba		

				DOG		007	of SI • A cc R • Sc ap Q R • L kı • C G G G	E LOGIO kills cquire s ompeter EASON olve car otitude j uantitat easonin earn do nowleds ompete cams lik ATE, C	CAL RE satisfacto acy in use NING npus pla papers co ive Abili g and Ve main spe ge in variou te CAT, GRE, GA	e of VEF cements overing ity, Logi erbal Abi crific us compe CMAT, TE, UPS	NG RBAL cal ility etitive SC,
PC		PO3	PO4	PO5	PO6	PO7 ✓	PO8 ✓	PO9	PO10	PO11 ✓	PO12
CO1 CO2	$\checkmark$ $\checkmark$	✓ ✓	×	✓ ✓	v	• √	•	▼ ✓	✓	▼ ✓	• •
CO2 CO3		· ·	• •	• •		• •	✓	•	· ✓	· · · · · · · · · · · · · · · · · · ·	• •
CO4	$\checkmark$ $\checkmark$	,			√			· •	•	· •	· •
CO5	✓ ✓	✓	✓	$\checkmark$	✓		~	✓		$\checkmark$	✓
CO6	<ul> <li>✓</li> </ul>	✓	$\checkmark$	$\checkmark$	✓	✓	✓	$\checkmark$	✓	$\checkmark$	✓
IV	INTE	RNATI	ONAL	CERTI	FICAT	ION	On co	mpletio	n of this	course,	
							•	devel Acqu Beco Have	opment ire new s me Indus more co	e on the skills stry ready nfidence l knowle	<b>y</b>
PC	D1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\sqrt{102}$	105 ✓	<u>↓</u>	√	√	<b>1</b> 0,∕	<u>↓</u>	<u>1</u> 0 ∕	1010	√ 1011	✓ ×
CO2	✓ ✓	<ul> <li>✓</li> </ul>	✓	$\checkmark$		✓		✓	✓	$\checkmark$	✓
CO3	<ul> <li>✓</li> </ul>	✓	~	√		$\checkmark$	$\checkmark$	✓	✓	✓	✓
CO4	<ul> <li>✓</li> </ul>				✓			✓		$\checkmark$	$\checkmark$
CO5	✓ ✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		✓	$\checkmark$		$\checkmark$	$\checkmark$
V	DIC	ITAL S	IGNAI	L PROC	CESSIN	IG		-	n of this	course,	
							•	contin period even/ detern signa Comp Conti LTI s convo	ify the sinuous/dia dic/aperi odd, ene ministic/ ls. pute the n nuous an ystem us	odic, rgy/power random response nd Discrete sing ntegral an	of a ete

								•	signa Comp FFT filter Anal and F	putation algorithm ing appro yze struc TIR Sys	of DFT uns and lin bach. ture for l tems	near FIR
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓ ✓		✓ ✓	✓ √	✓ √	~	✓ ✓	$\checkmark$	✓ ✓	√	✓ ✓	✓ ✓
CO2 CO3	✓ ✓	▼ 1 √	✓ ✓	 ✓	✓ ✓		▼ ✓	√	 ✓	▼ ✓	 ✓	▼ ✓
CO3	· •	· /	,	•	•	~	•	•	· √	•	· •	· •
CO5	~	<ul> <li>✓</li> </ul>	✓	~	~	✓		√	~		✓	✓
V			DMMUN						nts are a Unde comr Appl of ele under Noise syste Appl of sig under vario their Appl on A	erstand the nunication y the base ectronic of rstand the e in commu- m. y the base gnals and rstand the us modu spectral y the effect M and Fl yze the o	te basics on system ic knowl circuits a e effect of munication ic knowl systems e concep lations an analysis. ect of noi M system	n. edge nd of on edge and ts of nd see n.
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	~	$\checkmark$		✓	✓ ✓	$\checkmark$	<ul> <li>✓</li> </ul>	$\checkmark$	✓ ✓	1	✓ ✓	✓ ✓
CO2 CO3	✓ ✓		✓ ✓	✓ √	✓ ✓		✓ ✓	√	✓ ✓	✓ ✓	✓ ✓	✓ ✓
CO3	▼ ✓	▼ ▼		•	•	~	•	•	✓ ✓	•	• √	• √
CO5	~	✓	✓	$\checkmark$	✓	✓		✓	✓		✓	✓
V				VL	SI				e able to Demo of M CMC techn Draw the st diagr know desig Inter	b: onstrate of OS trans OS fabric ology sc the basi ick and l ams with ans with ans with ans cf of a spects	c gates u ayout the physical s. nory elen	nding ory, w and sing

									•	FPGA Interp testal Issue Analy and a	A based s pret testin pility s in VLS yze CMC irchitectu	knowledg system do ng and El Design DS subsy tral issue tstraints.	esign stems s with
	PC	<b>)</b> 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		$\checkmark$	✓	✓	~	$\checkmark$	~	$\checkmark$	✓	~		✓	✓
CO2		$\checkmark$	√	✓	✓	✓		$\checkmark$		~	√	✓	✓
CO3		$\checkmark$	✓	✓	~	√		✓	✓	~	✓	✓	$\checkmark$
CO4		$\checkmark$	✓				~			$\checkmark$		✓	✓
CO5		$\checkmark$	√	$\checkmark$	~	√	~		$\checkmark$	✓		$\checkmark$	$\checkmark$
V			FU	NDAM	ENTAI	LS OF A	AI & M	L	On co	mpletic	on of this	course.	└────┤ <sup>1</sup>
	PC	1	PO2	PO3	PO4	PO5	PO6	PO7	• • PO8	conce intell learn princ appli Appl and r techr probl pract probl pract probl pract probl pract probl pract probl pract probl pract probl pract probl pract prepr traini Critic optim intell learn parat	epts of an ligence a ing by ex- iples, alg cations. y artifici- nachine niques to lems, sho ical skill rocessing ing, and cally eva nize artifi ligence a ing mod vzing mo ormance, neters, a pretabilit	nd mach xplaining gorithms, al intellig learning solve owcasing s in data g, model evaluation luate and icial nd mach els by del hyper	ine g key and gence n. l
CO1		∕1 ✓	<u>102</u> ✓	105	<u>10</u> ∓ √	<u>105</u> √	100	107	100	<u>10</u> ,∕	1010 ✓	1011 ✓	1012 ✓
CO1		•	 ✓	✓	· · ·	 ✓	, ,		•	• •	· · · · · · · · · · · · · · · · · · ·	✓ ✓	· ·
CO2		•	 ✓	, ,	· · ·	 ✓	, ,	✓	✓	· ·	· ·	· ·	· ·
V				CON	FROL S	SYSTE	MS			e, the str Deve mode electr Deve for a using	udent sho lop the n el of mec rical syst lop trans	fer funct ntrol sys iagram	ble to: ical nd ion tem

								•	Anal	ysis of tin and secon	aph meth me respo nd order	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	✓		√	√	√		√	✓	$\checkmark$	✓	~
CO2	√	<ul> <li>✓</li> </ul>	✓	✓	√	✓			~	$\checkmark$	~	~
CO3	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	✓
V	PO1	PO2	ELEC	FROM	AGNET	FICS	PO7		e, the stu- Use of system and C evalue produ- confi Calcue potem charge behave across condi Expla	udent sho lifferent ms, Coul Gauss La ation of uced by c gurations that the tial due wior of el s a boun itions. ain the Po ace equat	energy a to a syste plain the ectric fie	ble to: te aw ields charge nd em of eld
CO1	<u>101</u> ✓	102	105	<u>10</u> ∓ √	105	100	107	<u>100</u> ✓	<u>10</u> ,∕	<u>1010</u> ✓	1011 ✓	1012 ✓
CO2			✓	✓	√	✓			✓	√	√	
	✓	<ul><li>✓</li></ul>							•	•	v	v
CO3	✓ ✓	$\checkmark$	~	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	~	✓	$\checkmark$	✓ ✓
		✓ ✓	~	ATINC	✓ G SYST	₩ ÈM	~		✓ ccessfu b, the str Demo and d Apply techn mana differ Use p memo and f	✓ I comple udent sho	tion of the puld be a need for the types of the types of the types.	ble to: OS
CO3		✓	✓ OPER				✓ PO7	course • •	ccessfu b, the str Demo and d Appl techn mana differ Use p memo and f comm	I comple udent sho onstrate i lifferent to y suitable iques for gement of orocesson orocesson ory, stora ile system nands.	tion of the puld be a meed for types of the types of the types of the types.	ble to: OS OS.
V V	▼ ✓ PO1 ✓	✓ ✓ ✓	~	✓ ATINC PO4 ✓	✓ G SYST PO5 ✓	¥ ÈM PO6 ✓	✓ PO7	course •	✓ ccessfu b, the str Demo and d Apply techn mana differ Use p memo and f	✓ I comple udent she onstrate i lifferent to y suitable iques for gement of rent reson processor ory, stora ile syster	tion of the puld be a need for the types of the types of the types.	ble to: OS
CO3	✓ PO1	✓ PO2	✓ OPER	PO4	PO5	PO6	✓ <u> PO7</u>	course • • • PO8	<ul> <li>ccessful</li> <li>c, the study</li> <li>Demo</li> <li>and d</li> <li>Apply</li> <li>technic</li> <li>mana</li> <li>differ</li> <li>Use p</li> <li>memo</li> <li>and f</li> <li>comm</li> </ul>	✓ I comple udent she onstrate i lifferent to y suitable iques for gement of orocessor orocessor orocessor orocessor ory, stora ile system nands.	tion of the puld be a need for types of types	ble to: OS OS.

V	S	TATIST	ICAL P	ROGR	AMMI	NG WI	TH R		e, the str Unde princ progr expla mani and t Appl techr analy show in da explo and t mode Critic comr insig analy statis effec findi	l comple udent she erstand the iples of state ramming dapulation pasic state y R prog hiques to visis and visit casing p ta manip pratory d pasic state eling. cally eva municate hts using vizing date tively vi- ngs to su ion-mak	buld be a be fundar statistica using R ta visualiz istical an ramming perform visualizar ractical s ulation, ata analy istical luate and statistica statistica g R by a, interpri ilts, and sualizing pport inf	ble to: mental l by ation, alysis. g data tion, skills rsis, l al reting
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	v	<ul> <li>✓</li> </ul>		✓	✓	✓		$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$
CO2	v	$\checkmark$	~	~	✓	✓	1		✓	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
V		INTRO	DUCT	V ION TO	D DAT	▲ SCIE	V NCE		e, the str Unde conce expla mani and t Appl techr analy show in da visua mode Critic comr insig patte conce visua	cally asso nunicate hts by ar rns, drav lusions, a llizing re ort inform	ould be a ne fundar ata scien ta , visualiz istical an ience explore ets, ractical s ng, and basi ess and data-dri nalyzing ving and effec sults to	ble to: mental ce by ation, lalysis. and skills c ven tively

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1	· · · · · · · · · · · · · · · · · · ·	102	105	· · · · · · · · · · · · · · · · · · ·	105	100 ✓	107	√	10) √	√ 1010	<u>√</u>	1012 ✓		
CO2	~	<ul> <li>✓</li> </ul>	✓	√	√	✓			√	✓	✓	✓		
CO3	√	<ul> <li>✓</li> </ul>	✓	$\checkmark$	√	√	✓	✓	√	$\checkmark$	✓	✓		
V		INTRO DATA ECOS MPLOY NHANC	, HAD YSTEN ABILI	OOP & A FY SKI				<ul> <li>Skills Academy</li> <li>On completion of this course, students are able to: <ul> <li>Understand the basic concept of QUANTITATIVE ABILITY</li> </ul> </li> </ul>						
								<ul> <li>Understand the basic concepts of LOGICAL REASONING Skills</li> <li>Acquire satisfactory competency in use of VERBAL REASONING</li> <li>Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning and Verbal Ability</li> <li>Learn domain specific knowledge</li> <li>Compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE,</li> </ul>						
								• (	Compet competi CMAT,	e in varie tive exai	ns like C GRE, GA			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	• (	Competi competi CMAT, UPSC, (	e in vario tive exan GATE, GPSC eto	ns like C GRE, GA c.	ATE,		
CO1	PO1	PO2	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7 ✓	• (	Compet competi CMAT,	e in vario tive exai GATE,	ns like C GRE, GA			
CO1 CO2	PO1			PO4 ✓	PO5 ✓	PO6 ✓	PO7 ✓	• ( ( ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	Competi competi CMAT, UPSC, (	e in vario tive exan GATE, GPSC eto	ns like C GRE, GA c.	ATE,		
	✓			PO4 ✓ ✓	PO5	PO6 ✓	P07 ✓ ✓	• ( ( ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	Competi competi CMAT, UPSC, (	e in varie tive exar GATE, GPSC ete PO10	ns like C GRE, GA c.	ATE,		
CO2	√ √	✓ ✓		PO4 ✓ ✓	PO5 ✓ ✓	PO6 ✓	PO7 ✓ ✓	● (0 (0 (0) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	Competicompetic CMAT, UPSC, 0 PO9	e in varie tive exar GATE, GPSC ete PO10	ns like C GRE, GA c. PO11 ✓	ATE,		
CO2 CO3	√ √	✓ ✓ ✓		PO4 ✓ ✓	PO5 ✓ ✓	PO6 ✓ ✓	PO7 ✓ ✓	● (0 (0 (0) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	Competicompetic CMAT, UPSC, 0 PO9	e in varie tive exar GATE, GPSC ete PO10	ns like C GRE, GA c. PO11 $\checkmark$ $\checkmark$ $\checkmark$	ATE,		
CO2 CO3 CO4 CO5 CO6	✓ ✓ ✓ ✓						✓ ✓ ✓ ✓	● (0 (0 (0 (0 (0)) (0)) (0)) (0)) (0)) (0	Compet competi CMAT, UPSC, PO9 V V V	e in varie tive exan GATE, GPSC etc PO10	ns like C GRE, GA c. PO11 ✓ ✓ ✓ ✓ ✓	ATE,		
CO2 CO3 CO4 CO5	✓ ✓ ✓ ✓	✓     ✓	<ul><li>✓</li><li>✓</li><li>✓</li></ul>	V V V ONAL	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ FICAT	✓ ✓ ✓ ✓ ION	● (0 () () () () () () () () () () () () ()	Competi competi CMAT, UPSC, PO9 V V V V mpletic nts are a Have devel Acqu Beco Have	e in varie tive exan GATE, GPSC etc PO10 ✓ ✓ ✓ ✓ on of this ble to: exposur opment ire new s me Indus	ns like C GRE, GA c. PO11 V V V course, re on the	ATE, PO12 ✓ ✓ ✓ ✓ Iatest		
CO2 CO3 CO4 CO5 CO6		✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	Image: wide wide wide wide wide wide wide wide	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ CERTI XENT T	✓ ✓ ✓ FICAT REND	$\checkmark$ $\checkmark$ $\checkmark$ <u><math>\checkmark</math></u> <u><math>ION</math></u> <u><math>S - 3</math></u>	● (0 (0) (0) (0) (0) (0) (0) (0) (0) (0) (	Competi competi CMAT, UPSC, 0 PO9 V V V V M mpletic nts are a Have devel Acqui Beco Have Get a	e in varie tive exar GATE, GPSC etc PO10 $\checkmark$ $\checkmark$ on of this ble to: exposur opment ire new s more co dditiona	ns like C GRE, GA c. PO11 V V V Course, e on the skills stry ready	ATE, PO12 ✓ ✓ ✓ ✓ Iatest		
CO2 CO3 CO4 CO5 CO6 V	✓ ✓ ✓ ✓	✓     ✓	V V V RNATI	V V V ONAL	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ FICAT	✓ ✓ ✓ ✓ ION	● (0 () () () () () () () () () () () () ()	Competi competi CMAT, UPSC, PO9 V V V V mpletic nts are a Have devel Acqu Beco Have	e in varie tive exan GATE, GPSC etc PO10 ✓ ✓ ✓ ✓ on of this ble to: exposur opment ire new s me Indus	ns like C GRE, GA c. PO11 V V Course, e on the skills stry ready	ATE, PO12 ✓ ✓ ✓ ✓ Iatest		
CO2 CO3 CO4 CO5 CO6	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	V       V       V       V       INTE       COUF	PO3	✓ ✓ ✓ ✓ ONAL CURF	✓ ✓ ✓ CERTI RENT T	✓ ✓ ✓ FICAT REND	✓ ✓ ✓ <u>✓</u> <u>ION</u> <u>S - 3</u>	● (0 (0) (0) (0) (0) (0) (0) (0) (0) (0) (	Competi competi CMAT, UPSC, 0 PO9 V V V V mpletic tis are a Have devel Acqui Beco Have Get a	e in varie tive exar GATE, GPSC etc PO10 $\checkmark$ $\checkmark$ on of this ble to: exposur opment ire new s more co dditiona	ns like C GRE, GA c. PO11 V V V Course, e on the skills stry ready onfidence l knowled	ATE, PO12 ✓ ✓ ✓ ✓ Iatest		

CO4     INTERNSHIP - 2       V     INTERNSHIP - 2       After studying this court will be able to:       • Remember and essential policie procedures, and		lents					
Remember and     essential policies							
essential policie							
		;					
		lines					
	of the organization as						
	presented during the						
orientation and	l trainin	g					
sessions.							
Apply the know     gained from the							
coursework to r		orld					
projects within		110					
organization, ef							
implementing the							
techniques relev field of study	evant to	their					
<ul><li>field of study.</li><li>Critically assess</li></ul>	ss their						
contributions to							
organization's g	goals,						
evaluate the cha	-	s					
faced during the							
internship, and		e					
	recommendations for						
	process improvements or innovative solutions.						
	<i>u</i> tions.						
	PO11	PO12					
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	✓ ✓	✓					
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	▼ ✓	▼ ✓					
VI ANTENNA & WAVE PROPAGATION On successful completion	•	nis					
course, the student shou							
• Understand the							
mechanism of E							
antennas and the patterns.	heir radi	ation					
Analyse the power of the p	wer rad	iated					
by different ante							
their radiation							
<ul><li>characteristics.</li><li>Interpret the relationships</li></ul>		ing					
• Interpret the relation between antenna		-					
Design and anal	-						
antennas and an		arrays.					
• Understand the							
propagation me different freque		n at					
	PO11	PO12					
	<u>√</u>	✓					

CO2	<b>√</b>	<ul> <li>✓</li> </ul>	✓	✓	✓		✓		✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓
CO3	✓	<ul> <li>✓</li> </ul>	✓	✓	✓		✓	✓	✓	$\checkmark$	<ul> <li>✓</li> </ul>	✓
CO4	√	✓				✓			✓		✓	✓
CO5	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
CO1 CO2 CO3 CO4 CO5 VI	▶       PO1       ✓	PO2	PO3	PO4 ✓ ✓	PO5	PO6 ✓	G ✓ ✓ ✓	• • • • • • • • • • • • • • • • • • •	imag Com algor Perfo enhai Appl segm Appl techn PO9 V V end of e able to Unde conce netwo proto com Appl princ confi netwo proto com confi netwo proto confi troub Critic optim by an perfo	e process pare tran ithms orm Cont ncement y algorith entation y compre- iques PO10 $\checkmark$ the cour orks by e ork archi cols, and nunicatio y compu iples to c gure, and ork setup ical skill guration leshootin cally asse nialyzing i	mentals sing sformation rast on image hms for ession PO11 ✓ ✓ ✓ ✓ ✓ ✓ Se, the st are fundant omputer explaining tectures, and on model ter network ses and puter network security I scalabil s to ensur-	on es. PO12 V V udent nental g s. orking shoot asing ork works ity re
	DO1	DOJ		$\mathbf{DO4}$	DOS	DOC	DO7		DOO	DO10	DO11	DO12
	PO1	PO2 ✓	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10 ✓	PO11 ✓	PO12
CO1				✓	✓	<b>√</b>		~	✓			<b>v</b>
CO2		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	✓	<b>√</b>			✓	✓	<ul> <li>✓</li> </ul>	✓
CO3	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓
VI		В	USINE	SS INT	TELLIG	ENCE			its are a		course, ne fundar	nental

						•	intell data minin techr Appl techr visua pract extra and l proce Critic optim intell analy dash decis enha maki organ	epts of b ligence b warehou ng, and r niques. ly busine niques to alize data ical skill action, tra oading (l esses. cally asso nize busi ligence sa yzing dat board des sion supp nce infor ing within	y explain sing, data eporting ss intellia analyze , showca s in data unsforma ETL) ess and ness olutions a quality sign, and ort syste med dec n	a gence and sing tion, by ms to ision-					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1 CO2	v			✓ ✓	✓ ✓	✓ ✓		✓	√ √	✓ ✓	✓ ✓	✓ ✓			
CO2 CO3	v	· ·	▼ ▼	▼ ▼	 ✓	▼ ▼	✓	√	 ✓	✓ ✓	✓ ✓	▼ ✓			
VI		INT	RODU	CTION	TO BU	JSINES	SS	On co	mpletic	on of this	course,				
				ANAG				students are able to:							
					•	funda mana theor term cours Appl of bu princ studi effec addre busir CO3 mana comp and v busir recon	ember ar amental l agement ries, and inology c se. ly their u usiness m riples to a es and de tive strat essing re- ness chall : Evaluat agement paring the weakness ness cont mmend s egies for <u>ness outc</u>	business concepts key covered i nderstand anageme analyze c evelop regies for al-world lenges. the differe approach eir streng ses in var exts, and uitable optimizit	n the ding ent ease						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1 CO2	v v			✓ ✓	✓ ✓	✓ ✓		√	✓ ✓	$\checkmark$	✓ ✓	✓ √			
CO2 CO3		▼ ✓	▼ ▼	↓ ↓ ↓	↓ ✓		✓	~	↓ ✓	▼ ✓	✓ ✓	▼ √			
005	v	•			•		•	•	•	•	•	•			

VI					RODUC			<ul> <li>On completion of this course, students are able to: <ul> <li>Remember and list essential entrepreneurship concepts, terminology, and the characteristics of successful entrepreneurs discussed in the course.</li> <li>Understanding of the key principles of entrepreneurship by explaining the process of identifying opportunities, assessing risks, and creating value in the market.</li> <li>Analyze real-life entrepreneurial ventures, critically evaluating the factors that contributed to success or failure, and identifying the strategies that were effectively employed.</li> </ul> </li> </ul>					
	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓	<u>√</u>	100	✓ ✓	<u> </u>	√	107	√	<u>√</u>	√	√	✓ ×
CO2		✓	$\checkmark$	$\checkmark$	✓	$\checkmark$	✓			$\checkmark$	√	✓	$\checkmark$
CO3	<u> </u>	$\checkmark$	√	✓	✓	✓	✓	$\checkmark$	✓	✓	✓	$\checkmark$	✓
VI										ts are a Rem fund meth term opera prese Appl techr solve optim demo to ch meth resul Eval limit opera applii prob prop	ember ar amental o odologies ations res ented dur y operati- niques to e comple- nization p onstrating oose app ods and	ad list the concepts es, and s used in search, as ing the c ions rese model a x real-wo problems g their ab oropriate interpret strengths differen search omparing to variou arios and proveme	s ourse. arch nd orld s, pility the and t and t s t unts or

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u>√</u>	<u>√</u>	100	<u>√</u>	√	<u> </u>	101	✓ ×	<u>↓</u>	✓ ×	✓ ×	✓ ×
CO2	√	✓	√	√	√	√			√	$\checkmark$	✓	✓
CO3	√	✓	$\checkmark$	√	$\checkmark$	√	✓	✓	√	✓	✓	✓
VI			▲L QU					studer	nts are a Rem fund conc term quali cove Appl mana techr impr organ demo to ide impr imple initia Eval of di mana vario conte impa	ember ar amental j epts, and inology r ty manag red in the y total q agement niques to ove proc nizations onstrating entify are ovement ement qu tives. uate the of ferent q agement ous organ exts, com ccts on peopue	course, ad list the principle key related to gement a e course. uality tools and analyze esses wit , g their ab eas for and uality effective: uality strategie izational paring the erforman sfaction, ss	s, total s l and hin vility ness s in neir ce, and
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	 ✓	v 		▼ √	v	V		•	v	✓ ✓	✓ ✓	✓
CO2 CO3	 ✓	• •	• •	▼ √	• •	• •	√	✓	• •	▼ ✓	▼ ✓	• •
VI		MICR	L V ROWAN	∕E CON	<u> </u>	On su	e, the st Need micro line. Appl techn mana differ resou Meas micro	l comple udent she of wave o strip tra y suitable iques for agement of rent micr	tion of the ould be a guides, a unsmission e r of of oowave of power,	ble to: ind		
]	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√		√	√	<ul> <li>✓</li> </ul>		✓	√	$\checkmark$	√	$\checkmark$
CO2	√	✓	√	$\checkmark$	$\checkmark$	<ul> <li>✓</li> </ul>			$\checkmark$	~	✓	$\checkmark$
CO3	√	✓	<ul> <li>✓</li> </ul>	√	✓	1 🗸	$\checkmark$	$\checkmark$	√	$\checkmark$	$\checkmark$	$\checkmark$

VI			NANO	) ELEC	CTRON	IICS		<ul> <li>On successful completion of this course, the student should be able to: <ul> <li>To introduce the challenges faced by present CMOS VLSI device design and fundamental limits of operation</li> <li>To study novel MOS based silicon devices and various multi gate devices</li> <li>To learn about SOI devices and its performance comparison with Silicon devices</li> </ul> </li> </ul>						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1	~	✓		✓	√	✓		$\checkmark$	✓	$\checkmark$	<ul> <li>✓</li> </ul>	✓		
CO2	~		<ul> <li>✓</li> </ul>	✓	✓	<ul> <li>✓</li> </ul>			✓	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>		
CO3 VI	<b>↓</b>	ער ארדי ער ארדי	✓ FICIAL				√ vvs		V	√ Loomnlo	$\checkmark$ tion of th	✓		
	DO1	PO1	DO2	DO4	POS	DOG	• H H H C C C C C C C C C C C C C C C C C	Explain principle network comprel compon Apply a urchitec problem bility t network Criticall artificial perform activatio opolog algorith	the fund es of arti s, showc hension of ents and rtificial r tures to s as, demon o design o design as for var ly assess l neural r ance by on functi- ies, and t ms to acl es	ficial neu casing of their b function neural ne solve div nstrating and trair ious task and opti- network analysing ons, netw training hieve adv	ural asic ing. twork erse the s. mize g vork zanced			
<u>CO1</u>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8 ✓	PO9 ✓	PO10 ✓	PO11 ✓	PO12		
CO1 CO2	✓ ✓	v v	✓	×	✓ ✓	✓ ✓		v	✓ ✓	✓ ✓	✓ ✓	▼ ✓		
CO2 CO3	· · ·	· ·	, ,	· ·	· √	· · ·	√	$\checkmark$	• •	✓ ✓	• •	· · ·		
VI		DEEP LEARNING TECHNIQUES							e, the st Dem unde found deep key p meth	udent sho onstrate rstanding dational	g of concepts by expla s and es.	ble to: in		

									•	probl imple netw tasks Anal learn critic archi paran strate	lems by o ementing ork mode yze and o ing mode cal assess tecture c neters, a egies to a	els for va optimize els throu ment of hoices, h nd trainin	g and urious deep gh nyper ng
	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		$\checkmark$	✓		√	√	<ul> <li>✓</li> </ul>		✓	✓	√	$\checkmark$	$\checkmark$
CO2		~	✓	<ul> <li>✓</li> </ul>	✓	<b>√</b>	<ul> <li>✓</li> </ul>			~	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3 VI		√	$\checkmark$			✓ REALI		$\checkmark$	✓	✓	✓ 1.001	✓ tion of th	<b>↓</b>
									•	Unde virtua and o device graph To be differ mode Unde perfo	erstand for al reality overview tes, outpunic displate ecome fa tent appr elling. erstand us rmance s	miliar wi oaches o	n of vorld s and ith f /R
	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<u>CO1</u>		✓	✓		<ul> <li>✓</li> </ul>	✓	<ul> <li>✓</li> </ul>		✓	<ul> <li>✓</li> </ul>	✓ ✓	✓ ✓	<ul> <li>✓</li> </ul>
CO2 CO3		✓ √	✓ ✓	✓ ✓	• •	✓ ✓	▼ ▼	✓	✓	∨	✓ ✓	$\checkmark$	✓ ✓
VI			REST JAVAS CLEAI	SCRIP	,		<u>                                      </u>			ubject v Acader		andled by	y IBM
VI			Ν	MINI PI	ROJEC	T WOF		e, the st Appl and s meth imple funct addre Prob Anal the n	udent sho y progra coftware odologie ement, an ional app esses a sp lem/Scer yze the r	plication pecific nario. equirement ect, breal	ble to: kills nent gn, that ents of		

								<ul> <li>into smaller components, and make informed design decisions to ensure efficiency and usability.</li> <li>Evaluate the effectiveness of their application in meeting user needs and solving the targeted problem. They will also critically assess the strengths and limitations of their solution and propose potential areas for enhancement.</li> </ul>					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1		/ /		√	√	√		√	$\checkmark$	$\checkmark$	$\checkmark$	✓	
CO2		/ /	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$			$\checkmark$	$\checkmark$	✓	$\checkmark$	
CO3		✓ ✓ EMPLOY	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓	$\checkmark$	$\checkmark$ on of this	$\checkmark$	$\checkmark$	
	PO1	PO2					PO7	<ul> <li>U</li> <li>U</li> <li>of</li> <li>U</li> <li>of</li> <li>Si</li> <li>A</li> <li>co</li> <li>R</li> <li>R</li> <li>Si</li> <li>ap</li> <li>Q</li> <li>R</li> <li>C</li> <li>en</li> <li>G</li> <li>G</li> <li>G</li> </ul>	f QUAN ndersta f LOGI kills cquire s ompeter EASON olve can otitude j uantitat easonin earn do nowleds ompete cams lik	nd the ba NTITATI nd the ba CAL RE satisfactor ncy in us NING mpus pla papers co tive Abil ng and Vo main spe ge in vario ce CAT, GRE, GA	e of VEF cements overing ity, Logi erbal Ab ecific us compo	LITY epts VG RBAL cal ility etitive SC,	
CO1	POI	PO2	PO3	PO4	PO5 ✓	PO6	PO7 ✓	PO8 ✓	P09	PO10	POII ✓	PO12	
CO1				 ✓	 ✓		• √	•	•	√	✓ ✓	· · · · · · · · · · · · · · · · · · ·	
CO2 CO3				√	· √		· √	√		· ✓	· •	· •	
CO4						✓		-	· ✓		✓ ×	✓ I	
CO5		/ /	· •	√	√	√		√	✓		✓	✓	
CO6		∕ √	✓	√	✓	✓	$\checkmark$	$\checkmark$	✓	✓	✓	✓	
VI			RNATI RSE ON						tts are a Have devel Acqu Becor	exposur opment ire new s me Indus	e on the	y	

1								•	Get a	dditional	l knowle	dae			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
C01	101 ✓	102	105	104	105	100	107	100	109	1010	1011	1012			
CO1 CO2	•	 ✓	· · ·	•	• •	•	•	•	•	<b>√</b>	· ✓	•			
-	 ✓	 ✓	•	•	 ✓		•	√	•	✓ ✓	✓ ✓	•			
CO3			v	v	v		v	v	✓	v	 ✓	•			
CO4	✓	<u>√</u>				•			×		•	•			
CO5	<b>▼</b>	•	✓ LF-MO	V	<b>v</b>	V		v V	•		v tion of th	<b>∨</b>			
	PO1	·     ·													
CO1	✓			✓	<b>√</b>	√	✓	✓	<b>√</b>		-	✓			
CO2	<ul> <li>✓</li> </ul>		<b>√</b>	✓	<b>√</b>		✓		<b>√</b>			✓			
CO3	<ul> <li>✓</li> </ul>		<b>√</b>	✓	$\checkmark$		✓	✓	<b>√</b>	✓		✓			
CO4	✓	<u> </u>				√			✓		<ul> <li>✓</li> </ul>	✓			
CO5 VII	✓	$\checkmark$	✓	✓ JD COI	√	$\checkmark$		✓	$\checkmark$	on of this	$\checkmark$	$\checkmark$			
								•	unde comp expla servi deplo Appl skills mana cloud show profi cloud Critic optim solut scala cost o infor maxi	onstrate rstanding puting fu aining ke ce mode byment n y cloud of s to desig age appli d environ vcasing p ciency ir d services cally asso nize clou ions by a bility, se considera med deci	g of cloud ndament y concep ls, and nodels. computin m, deploy cations in ments, ractical n utilizing s. ess and d-based unalyzing curity, an ations, m isions to benefits	als by ts, g y, and n g nd aking			
CO1 CO2 CO3 VII	PO1	PO2 ✓ ✓	PO3	PO4 ✓ ✓ R ELE	PO5 ✓ ✓ CTRON	PO6 ✓ ✓ VICS	<u>PO7</u>		nts are a Desc	ribe the c	PO11 ✓ ✓ course, course, character				

		1		DO2	DO4	DOS	POF	DO7	•	appli it. Deter respondent circu trigge Deter contr resist loads opera and s Illust powe conve Illust inver switc	cations a rmine the onse of a it with va- ering opt rmine the olled rec ive and i . Illustra tion of in tatic swi rate the v er circuit erter. rate the o ter circuit hes.	thyristor arious ions. e respons tifier wit nductive te the nverter c tches. working of as DC-D operation it and sta	l with e of h ircuit of C of tic
<u>CO1</u>	PO	01 ✓	<u>PO2</u> ✓	PO3	PO4	PO5 ✓	PO6	PO7 ✓	PO8 ✓	<u>PO9</u> ✓	PO10	PO11 ✓	PO12
CO1 CO2		▼ √	 ✓	 ✓	 ✓	• ✓	v	 ✓	v	 ✓	✓	• •	▼ ✓
CO2		· •	 ✓	 ✓	/	 ✓		✓	✓	·	✓	· ✓	· •
CO4		$\checkmark$	√				√			√		✓	✓
CO5		$\checkmark$	√	✓	~	√	✓		✓	√		✓	✓
VII		DI	GITAL	SWIT	CHING	SYSTI	EM		On su	ccessfu	l comple	tion of th	is
									•	Desc electri syste Com switc digita Deter telecc and i Defir assoc switc Desc aspec and i	ribe the comechan ms pare elecc hing system al switch rmine the communic ts measure the the tecc itated with hing ope ribe the set ts of switch	eation tra rements. chnologie ch the dat crations. software tching sy enance.	tching nical n the ffic s a vstems
	PO	11	<u>PO2</u> ✓	PO3	PO4	PO5	PO6	PO7 ✓	PO8	PO9	PO10	PO11 ✓	PO12
CO1 CO2		• √	 ✓	✓ ✓	✓ ✓	✓ ✓	•	▼ √	v	 ✓	✓	✓ ✓	×
CO2 CO3		• •	 ✓	▼ ✓	 ✓	 ✓		• •	✓	 ✓	 ✓	 ✓	▼ ✓
CO3		· •	 ✓		*		$\checkmark$	•	•	 ✓	•	✓ ✓	· •
CO <sub>4</sub>		✓	· ✓	✓	✓	✓	∕		√	 ✓		· •	·
VII				NETW	ORK S	SECUR	ITY			e, the st Unde	udent sho erstand th	tion of th ould be a he import acks and	ble to:

CO1	PO1 ✓	PO2	PO3	PO4	PO5	PO6	PO7	• • • • PO8	Expla DES Unde Prime Facto remai Crypt Expla Kerbe Agree Unde Archi Algoi	and AES rstand ir es, Prima orization, inder the tosystem ain the co ores, Syr ement, P rstand S itecture,	structure S nportance ality testi Crinese orem and concept of nmetric l GPS/MII SL Hash L Messa	e of ng, d RSA Key ME.		
CO2	✓	✓ <b>√</b>		✓	✓		✓		✓	✓	✓	$\checkmark$		
CO3	 ✓	· · ·	✓	✓	 ✓		✓	✓	✓	· ✓	· ✓			
CO4	✓	 ✓				√			✓		✓	✓		
CO5	√	<ul> <li>✓</li> </ul>	✓	~	✓	✓		✓	√		✓	✓		
VII					DN CH			course • •	e, the str Demo of Me CMC techn Draw the st diagr know desig Intern along consi Demo FPG/ Intern testat Desig Analy	udent sho onstrate o OS trans OS fabric. ology sc the basi ick and J ams with dedge of n aspect: oret Men g with tim deration: onstrate J A based so oret testin oility issu gn yze CMC rchitectu	ic gates u layout n the physical s. nory elen ning s knowledg system de ng and ues in VI DS subsy ural issue nstraints.	ble to: nding ory, w and using nents ge of esign LSI stems s with		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	✓	$\checkmark$	<ul> <li>✓</li> </ul>	✓	✓		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>		
CO2	✓	<b>√</b>	<ul> <li>✓</li> </ul>	✓	✓		✓		✓	<u> </u>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>		
CO3	√	· ·	<b>√</b>	$\checkmark$	✓		$\checkmark$	$\checkmark$	✓	$\checkmark$		<ul> <li>✓</li> </ul>		
CO4	✓					✓			✓			<ul> <li>✓</li> </ul>		
CO5	∕		<b>√</b>	V	✓	✓			✓			└ <u> </u>		
VII														

		DO2	DO2	PO4	DOF	POC	D07	•	mixe Anal of IC Desig conve circu Anal ratio signa Desig phase	d signal l yze the c based C gn of vari erter arch its. yze the si and mod ls. gn of osc e lock loo	ignal to r leling of r illators a op circuit	cuit. stics ters. noise mixed nd
COL	PO1 ✓	PO2 ✓	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7 ✓	PO8 ✓	PO9 ✓	PO10	PO11 ✓	PO12
CO1 CO2	• •	▼ ▼	• •	• •	• •	•	 ✓	•	• •	✓	✓ ✓	• •
CO2 CO3	• •	▼ ▼	▼ ✓	• •	 ✓		• •	√	 ✓	✓ ✓	✓ ✓	• •
CO4	· √	· ✓	•	-		√	-	-	· √	•	· •	· •
CO5	√	✓ <b>√</b>	✓	✓	√	√		✓	√		✓ <b>√</b>	✓
VII		11	NTROD			INEMS			e, the st Unde and A Appl platfo Anal	udent sho erstand M Actuators y differen orms	nt transd	ble to: ors uction
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	PO1 ✓	PO2 ✓	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7	PO8 ✓	PO9 ✓	PO10 ✓	PO11 ✓	PO12 ✓
CO1 CO2	PO1 ✓		PO3	PO4 ✓		PO6 ✓	PO7	PO8 ✓	PO9 ✓			PO12 ✓
CO2 CO3	√	✓ ✓ ✓	✓ ✓	✓ ✓ ✓	$\checkmark$	$\checkmark$ $\checkmark$	<ul> <li>✓</li> </ul>	✓ ✓	$\checkmark$	<ul><li>✓</li><li>✓</li><li>✓</li></ul>	✓ ✓ ✓	✓ ✓ ✓
CO2		✓ ✓ SE	✓ ✓ ENSOR:	✓ ✓ S AND	✓ ✓ ACTU	✓ ✓ ATORS	<b>√</b> 5	✓ ✓ On su course •	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	I comple udent sho concepts ods for c ical paran rical quan ct correc cted perfo us sensor te differe ors used i cations a importar	tion of the puld be a in common onverting meter inter intity. The type of the rs. ent type of the n real lift and parap- nce. the concept	✓ ✓ ✓ iis ble to: ion g a o an of o an of hrase bt of
CO2 CO3 VII	✓ ✓ ✓ PO1	✓ ✓ SE PO2	PO3	✓ ✓ ✓	✓ ✓ ACTU	$\checkmark$ $\checkmark$	✓ 5 PO7	✓ ✓ On succourse • • • PO8	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ I comple udent sho concepts ods for c ical paran cical paran cical quan ct correc cted perfo us sensor te differe ors used i cations a importan	✓ ✓ ✓ ✓ tion of the puld be a in common onverting meter into nity. etly the ormance rs. ent type of n real lift nd parap nice. ne concept	✓ ✓ ✓ iis ble to: on g a o an of of f e hrase
CO2 CO3 VII	✓ ✓ ✓ ✓ ✓	✓ ✓ SE PO2 ✓	PO3	✓ ✓ S AND	✓ ✓ ACTU	✓ ✓ ATORS	✓ 5 PO7 ✓	✓ ✓ On su course •	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ I comple udent sho concepts ods for c ical paran rical quan ct correc cted perfo us sensor te differe ors used i cations a importan erstand th tor PO10	✓ ✓ ✓ tion of the puld be a in common onverting meter into nity. ty the ormance rs. ent type of n real lift nd parap nice. the concept PO11	✓ ✓ ✓ iis ble to: ion g a o an of o an of hrase bt of
CO2 CO3 VII	✓ ✓ ✓ ✓	✓ ✓ SE PO2	PO3	✓ ✓ S AND	✓ ✓ ACTU	✓ ✓ ATORS	✓ 5 PO7	✓ ✓ On succourse • • • PO8	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	I comple udent sho concepts ods for c ical paran rical quan ct correc cted perfo us sensor te differe ors used i cations a importar	✓ ✓ ✓ ✓ tion of the puld be a in common onverting meter into nity. etly the ormance rs. ent type of n real lift nd parap nice. ne concept	✓ ✓ ✓ iis ble to: ion g a o an of o an of hrase bt of

VII			ELESS S			WORK	S AND		e, the st Unde princ netw comp netw mana issue Appl netw comp desig and r syste Critic optim netw comp evalu perfc effic: consi data	y wireles ork and r outing co gn and de reliable c	build be a me founda wireless mobile explain ocols, end and mot ss sensor mobile moepts to ploy effi ommunia lyze and eless sens mobile lutions b twork energy d securit s for effe sion and	ble to: ational sensor ing ergy bility cient cation sor y
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	<b>↓</b>		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	√		$\checkmark$	√	✓	<ul> <li>✓</li> </ul>	✓
CO2	<b>√</b>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	✓		✓	$\checkmark$	$\checkmark$	<ul> <li>✓</li> </ul>
VII			SOFT	WARE	TEST	ING			e, the st Unde princ testim meth and t Appl techn execu show in ide ensur Critic optim proce testim	l comple udent sho prstand the iples of sing by exp odologie esting lev y softwa iques to ute test car casing p entifying ving softwa cally asses nize softwa esses by a rage, auto egies, and ig to ensu- vare valio ication.	tion of the build be a software blaining t s, technic vels. re testing design at ases, ractical s defects a ware qual ess and ware testi analyzing comation l regression	ble to: nental esting ques, g nd kills and lity. g test ion cive
C01	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11 ✓	PO12
1 ( )( )1	· · · · · · · · · · · · · · · · · · ·	/	1	. /	/	· ./				$\checkmark$		

CO2		✓	$\checkmark$	✓	✓	$\checkmark$	<ul> <li>✓</li> </ul>			$\checkmark$	√	✓	$\checkmark$
CO3		✓	✓	✓	✓	√	√	✓	✓	✓	✓	✓	✓
VII			SOC	CIAL A	ND WE	BANA	ALYTI(	CS		e, the stu Unde conce analy colled and t Appl analy user engag Critic optin analy analy user infor enhan	udent sho erstand the epts of so vices by ection me ools. y social average vices tech vze and in behavior gement p cally asse nize soci vices strat vzing inst ics, and r med dect	batterns. ess and al and we tegies by ights, ref making isions to al marke	ble to: ational web g data etrics, o online eb ining
	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		$\checkmark$	✓		✓	✓	✓		✓	$\checkmark$	$\checkmark$	✓	$\checkmark$
CO2		~	✓	$\checkmark$	$\checkmark$	$\checkmark$	✓			✓	$\checkmark$	✓	$\checkmark$
CO3		$\checkmark$	$\checkmark$	$\checkmark$	✓	√	√	✓	✓	$\checkmark$	√	√	✓
VII			BIOM	EDICA	L INS I	IRUMI	ENTAT	ION		e, the stu Diffe poten propa Illust place physi Desig	udent sho rentiate o titals and agations. rate diffe ment for ological gn bio an us physio	erent elec various recordin nplifier fo	ble to: bio trode gs
	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓	✓		✓	$\checkmark$	✓		✓	~	✓	<ul> <li>✓</li> </ul>	✓
CO2		✓	✓	~	✓	✓	<b>√</b>	✓	/	~	<u>√</u>	✓ ✓	✓ ✓
VII		<u>•</u>	OF	<b></b> TICAL	v, FIBE₽	R NETV	VORKS			e, the stu Obtai optica comm Unde chara fibre. Ident	udent sho in the km al fibre nunication rstand tr cteristics ify and e ing of va	ansmissi s of optic	ble to: on al

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	,			√	√	√		✓	∕	✓ <b>√</b>	✓ <b>√</b>	✓
CO2	۰	<ul> <li>✓</li> </ul>	✓	√	√	<ul> <li>✓</li> </ul>			$\checkmark$	✓	✓	$\checkmark$
CO3	Ņ	√	´ <b>√</b>	√	✓	✓	✓	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
VII		CIB	ER LAW	5 ANL	υΑ1 <i>ξ</i>	<b>Υ</b> ΓΚΙ Υ	AL I		e, the st Und fund cybe by ey fram and e Appl laws regul addre digit Critic recon safeg and c laws persp	l comple udent she lerstand t amental p r laws an kplaining eworks, p ethical co by knowle and data lations to ess legal al enviro cally asse mmend s guarding complyin , conside pectives a issues.	buld be a he principle d data pri- regulatio onsiderati edge of c privacy analyse challeng nments. ess and trategies data priv g with c ring glob	ble to: s of tivacy ns, tons. tyber and es in for tacy yber bal
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	,		-	√	✓	<u> </u>		✓	∕	√	√	✓
CO2	١	∕ √	´ <b>√</b>	√	✓	✓			√	$\checkmark$	$\checkmark$	$\checkmark$
CO3	۰	∕ ✓	´ <b>√</b>	$\checkmark$	<ul> <li>✓</li> </ul>	✓	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
<ul> <li>VII DISTRIBUTED COMPUTING SYSTEMS</li> <li>Explain the fundamental concepts of distributed computing systems by demonstrating comprehension of distributed architecture, communication protocols, and synchronization mechanisms.</li> <li>Apply distributed computing techniques to design and implement scalable and fault-tolerant systems, showcasing practical skills in distributed algorithms and data consistency.</li> <li>Critically assess and optimize distributed computing solutions by analysing performance bottlenecks, load balancing strategies, and fault recovery mechanisms to achieve efficient and reliable distributed systems.</li> </ul>											and ns. ng ilt- ng d ency. ize tions	
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CO2 CO3	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	v		/	✓	✓ ✓	✓ ✓	$\checkmark$		✓ ✓
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CO3	√			 ✓	 ✓		$\checkmark$	✓	 ✓	✓	✓	$\checkmark$
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CO2	<b>√</b>	<ul> <li>✓</li> </ul>	✓	✓	✓	✓			✓	✓	<ul> <li>✓</li> </ul>	✓
CO3	<b>√</b>	$\checkmark$	✓	✓	✓	✓	$\checkmark$	✓	✓	✓	$\checkmark$	<b>└ ✓</b>
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PC	D1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	<u> </u>		<ul> <li>✓</li> </ul>	~	<ul> <li>✓</li> </ul>		✓	~	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2	✓ ✓	$\frac{\checkmark}{\checkmark}$	<ul> <li>✓</li> </ul>	<b>√</b>	✓ √	<ul><li>✓</li></ul>	✓		✓	✓ ✓	$\checkmark$	<ul> <li>✓</li> </ul>
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CO1 PC	ות ⁄	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11 ✓	PO12
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CO2		$\checkmark$	✓	✓	√	<b>√</b>	√			$\checkmark$	✓	✓	$\checkmark$
CO3		$\checkmark$	✓	✓	√	√	√	✓	√	√	✓	✓	✓
VIII				MAJ	OR INT	TERNS	HIP					urse, stud	lents
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	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓	<u> </u>		<ul> <li>✓</li> </ul>	<b>√</b>	<b>√</b>		$\checkmark$	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2		✓ √	✓ √	✓ ✓	✓ √	✓ ✓	✓ √			✓ ✓	✓ √	✓ √	✓ √
CO3		v	v	v		v FCT	v	v	<b>v</b> Each (	v	<b>v</b>		v co. of
VIII					PROJ	ECT				lty, is re Unde objec proje sumr goals antic Plan proje comp proje meth deliv prelin Evalu their proje	equired t erstand th crives of ect, and b marize th s, require ipated ou and desi ect by out orehensiv osal that ect scope odologie erables, minary ti uate the f proposed ect, consi	ne scope the majo e able to e project ments, a itcomes. gn the m tlining a ve projec includes , objectiv es, expect and a meline. feasibilit	and r 's nd ajor t res, red y of ctors

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	√	<ul> <li>✓</li> </ul>		✓	✓	✓							
CO2	√	<ul> <li>✓</li> </ul>	$\checkmark$	√	√	√							
CO3	√	<ul> <li>✓</li> </ul>	$\checkmark$	<ul> <li>✓</li> </ul>	√	√	$\checkmark$	✓	✓	✓	✓	$\checkmark$	

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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

## **PROGRAMME SPECIFIC OUTCOMES (PSO):**

• PSO1: Programming and software development skills: Ability to employ modern

Computer languages, computing environments and standard practices for analysing, Designing and developing optimal solutions to deliver quality software products.

• PSO2: Domain specific skills: Ability to apply techniques to develop computer based solutions in various domains like Artificial Intelligence, Machine Learning, Network Engineering, Image Processing, Web Technologies and Data Sciences.

Semester	Titl	e				Cours	e Outco	mes	
Ι	MATHEMATION FOUNDATION ENGINEERS				ole to: Und solv equa App to so curv com Solv math	erstand ing the tions. ly the l olve pro- es and puter a re prob- nematio	l the ma system cnowled oblems r modula lgorithn lems wi cal tools	student trix theo of linea lge of ca related to r arithm ns. th mode namely V/MATI	ory for r llculus o polar etic to rn
PO1 PO	D2 PO3 PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1 🗸	✓ ✓	<ul> <li>✓</li> </ul>	$\checkmark$		✓	$\checkmark$	$\checkmark$	✓	$\checkmark$
CO2 🗸	✓ ✓ ✓	✓	$\checkmark$			√	✓	✓	$\checkmark$
CO3 ✓	$\checkmark$ $\checkmark$ $\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Ι	APPLIED PHY ENGINEERING		N		ble to: Deve prine solv Und conc of ne App	elop th ciples of ing ski erstand cepts, w ew tech ly the o	e knowl of physic lls. I the prin	nciples, and app of	basic roblem- lication

## **COURSE OUTCOMES (CO):**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1	<i>✓</i>	<u> </u>		✓	✓	✓		✓	✓	✓	✓ <b>√</b>	✓ <b>·</b>				
CO2	$\checkmark$	$\checkmark$	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	✓			$\checkmark$	~	✓	$\checkmark$				
CO3	$\checkmark$	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	~	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$				
	I		ROGRA				After be ab	ole to: To u prog hanc Dev logic Solv and	To understand structural programming concepts like array handling and string manipulation Develop programs and test a give logic. Solve a problem into functions and to develop modular reusable code.							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1	~	$\checkmark$		✓	$\checkmark$	✓		√	√	$\checkmark$	✓	$\checkmark$				
CO2	$\checkmark$	$\checkmark$	<ul><li>✓</li></ul>	$\checkmark$	$\checkmark$	$\checkmark$			$\checkmark$	✓	✓	$\checkmark$				
CO3	$\checkmark$	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$				
			LECTR		3		<ul> <li>After studying this course, students will be able to:</li> <li>Understand concepts of electrical circuits and elements, Logic circuits and gates</li> <li>Analyze simple circuits containing transistors.</li> <li>Apply the inverting and non-inverting configuration of Op-Amp.</li> </ul>									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1	✓	<b>√</b>		<b>√</b>	✓ ✓	✓ ✓		✓	<ul> <li>✓</li> </ul>	✓ ✓	✓ ✓	✓ ✓				
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	1						be ab	•	ng uns	course,	studem	s will				
		COMMUNICATION AND COMPUTINGbe able to:• Identify and classify different							ent							
			ECHN(		Y				•		assess t					
		11		environmental impact.												
							<ul> <li>Evaluate various waste treatment and disposal methods and select appropriate techniques for specific waste types.</li> <li>Analyze and describe the 3D</li> </ul>									
								prin	ting tec	hnologi	les, infor	rmation				

									supe unde	ercomp	omputer uters an applica		cyber
	PO1	PO	2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2	√		$\checkmark$	~	✓	$\checkmark$	✓			✓	$\checkmark$	✓	$\checkmark$
CO3	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓	✓	$\checkmark$
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C01	<u>r01</u> √	<u>F02</u>	105	<u>r</u> 04 √	r05 ✓	r00 V	r0/	r08 √	r09 √	F010 ✓	r0∏ ✓	<u>r012</u> ✓
CO1	 ✓	 ✓	✓	 ✓	√	· √			√	✓	✓ <b>√</b>	· ✓
CO3	✓	<b>√</b>	<ul> <li>✓</li> </ul>	✓	√	✓	✓	√	✓	$\checkmark$	✓	✓
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									-	-	stems f	
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CO2	√	√	<ul> <li>✓</li> </ul>	✓	✓	✓			✓	~	✓	✓
CO3	✓	√	<ul> <li>✓</li> </ul>	✓	✓	✓	$\checkmark$	√	✓	$\checkmark$	✓	$\checkmark$
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CO1		√			√	 		√	∕	√	<b>√</b>	✓ ×
CO2	✓	✓	<ul> <li>✓</li> </ul>	✓	$\checkmark$	✓			$\checkmark$	$\checkmark$	✓	✓
CO3	<ul> <li>✓</li> </ul>	✓	<ul> <li>✓</li> </ul>	✓	✓	✓	✓	✓	✓	✓	$\checkmark$	$\checkmark$
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	Ι				NIAL			ole to: To g and	ain the	knowle measur		causes r

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CO1	√	•		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓		$\checkmark$	✓	<u>√</u>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2 CO3	√ √			✓ ✓	√ √	✓ √			✓ √	✓ ✓	✓ ✓	✓ ✓
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CO1	$\checkmark$		/	$\checkmark$	$\checkmark$	✓		$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
CO2	√			<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓			✓	<u>√</u>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3	✓ II	, Т	V V FOUND			✓	✓	✓ 	✓	√ (h = 1-m =	✓	✓ ✓
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓ <b>√</b>			_ ✓				√		✓ V	✓ ×	$\checkmark$
CO2	√			<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$			$\checkmark$	✓	<b>√</b>	<ul> <li>✓</li> </ul>
CO3	√ 11				$\checkmark$	$\checkmark$	✓ ▲ C	✓ ↓ 1 ·	✓ √	$\checkmark$		· · · · · · · · · · · · · · · · · · ·
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CO1         ✓           CO2         ✓	• 	• •	• •	• •		v	• •	▼ ✓	▼ ✓	✓ ✓
$CO_2 \checkmark$		• ✓	• •	• •	~	~	• •	• •	• •	▼ ✓
II	FUNDAI	MENT	ALSO	)F	After	studvi	ng this	course	student	s will
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CO2 🗸	✓ ✓	✓	✓	✓			✓	~	✓	$\checkmark$
CO3 🗸	$\checkmark$ $\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
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CO1         ✓           CO2         ✓	/	✓ ✓	✓ ✓	✓ ✓		•	◆ ✓	✓ ✓	$\checkmark$	✓ ✓
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CO2	✓		✓	✓	✓	✓	✓			✓	$\checkmark$	✓	$\checkmark$		
CO3	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
	II		IN	TROD	UCTI	ON TO	)			ng this	course,	, student	s will		
			DI	RONE	TECH	NOLO	GΥ	<ul> <li>Explain the different types of drones and their applications in various industries.</li> <li>Identify the key components of drones and comprehend their functionalities.</li> <li>Apply drone technology in practical scenarios to address real-world challenges.</li> </ul>							
	PO1	PO	)2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
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CO3	✓		$\checkmark$	✓	✓	√	✓	✓	√	✓	$\checkmark$	✓	$\checkmark$		
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	Π			DNSTI DIA	TUTIC	DIN OF		<ul> <li>To gain the knowledge about Indian constitution.</li> <li>To understand the fundamental rights and duties listed in Indian constitution.</li> <li>To identify individual role and ethical responsibility towards society.</li> </ul>							
	PO1	PC	02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		

C01	<b>√</b>	1	$\checkmark$		$\checkmark$	√			$\checkmark$	<b>√</b>	$\checkmark$	<ul> <li>✓</li> </ul>	$\checkmark$
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CO2	√		$\checkmark$	√	√	√	✓			√	✓	✓	$\checkmark$
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	PO1	PO	2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2	✓	1	✓	$\checkmark$	$\checkmark$	√	✓			_ √	√	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$

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	III   PRINCIPLES OF							After	·Learn	ing this	s Course	e, Studei	nts will
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			IN	TELL	IGENC	СE		•	Expl	lain the	basic p	rinciple	s and
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	III				SS PROMENT.		5		ble to: Und improrga Ana integ that tech orga To a	erstand roveme nizatio lyze, in gration leverag nical ca nizatio pply an	l and sug ents that nal perf nplemer strategy ges orga apabiliti n. nd impro	will ber	nefit e. cesses al and iness
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CO2	✓		$\checkmark$	✓	✓	~	~			✓	✓	✓	$\checkmark$
CO3	✓		$\checkmark$	√	~	~	~	~	✓	✓	$\checkmark$	✓	$\checkmark$
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	PO1	PC	)2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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III UNIX AND SHELL PROGRAMMING									ole to: Expl syste com Ana cons App	lain Un em, and mands lyze the	ix Arch l use of e Shell I process concepts	student itecture, basic Program fundam s and wr	File ming entals

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CO2	<ul> <li>✓</li> </ul>	``		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓			<ul> <li>✓</li> </ul>	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>		
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				JNICA	ATIONS       be able to:         • Understand basic Data Communication Technology and Network Types & Topologies.         • Analyze the different Network Models and Transmission Media.         • Apply the different Multiplexing and Switching Techniques. Error Detection and Correction Techniques.         4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12									
C01	PO1	PO2	PO3	PO4	PO5 ✓	PO6 ✓	PO7	PO8 ✓	PO9 ✓	$\checkmark$	$\checkmark$	PO12 ✓		
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C01	PO1	PO2	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7 ✓	PO8 ✓	PO9 ✓	PO10	PO11 ✓	PO12		
CO2	~	``	✓	✓	✓		√		✓	√	✓	$\checkmark$		
CO3	✓	١	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	$\checkmark$		$\checkmark$	√	$\checkmark$	$\checkmark$	✓	$\checkmark$		
CO4	<ul> <li>✓</li> </ul>	١				<b>√</b>			<b>√</b>		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>		
CO5 CO6	✓ ✓	<u> </u>		✓ ✓	✓ √	✓ √	./	$\checkmark$	✓ 	√	$\checkmark$	✓ ✓		
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CO2 🗸	~	<ul> <li>✓</li> </ul>		✓					✓	$\checkmark$
CO3 🗸	✓	<ul> <li>✓</li> </ul>	√		✓	✓	$\checkmark$			✓
CO4 ✓		<b>√</b>		√	✓					✓
CO5 ✓		✓		$\checkmark$	4.0	✓		$\checkmark$	✓	
III	INTERN	SHIP -	-1			-	ng this	course,	student	s will
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
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CO2	✓	✓ ✓	✓ ✓	<ul> <li>✓</li> </ul>	✓ ✓	✓			√	✓ ✓	✓ ✓	✓			
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1		~		<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	<b>√</b>	<ul> <li>✓</li> </ul>	$\checkmark$	<ul> <li>✓</li> </ul>			
CO2 CO3		√ √	✓ ✓	✓ ✓	√ √	✓ ✓			√ √	✓ ✓	✓ ✓	✓ ✓			
	IV			TRUC			<ul> <li>After studying this course, students will be able to:         <ul> <li>Understand the basic principles and operations of data structures.</li> <li>Apply Hashing, Disjoint sets, String Matching techniques, advanced Trees and Graphs for solving problems effectively.</li> <li>Analyze the given scenario and choose appropriate Data Structure for solving problems.</li> </ul> </li> </ul>								
CO1	PO1 ✓	PO2 ✓	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7	PO8 ✓	PO9 ✓	PO10 ✓	PO11 ✓	PO12 ✓			

CO2	✓		✓	✓	$\checkmark$	✓	$\checkmark$			✓	√	<ul> <li>✓</li> </ul>	$\checkmark$		
	√		~	✓	✓	✓	✓	√	√	✓	$\checkmark$	<ul> <li>✓</li> </ul>	✓		
CO2 CO3	IV			JNDAI ACHIN				✓ After be ab ●	le to: Com conc inclu unsu engi eval selec appr App algo dem prep asse metr prob Ana and learr topic inter strat	apreher cepts of uding s upervise neering uation, ction ar opriate ly mac rithms onstrat rocess ss perfe- ics, fos lem-so lyze the conside ning, cr es such pretabi egies to	course, ad the for machin upervise ed learn g, and m enablin ad applie techniq hine lea to real-v ing the a data, tra ormance stering p lving sk e ethical erations itically as bias, lity, and o mitiga	oundatio ne learni ed and ing, feat odel g inform cation o jues. rning world da ability to ability to ability to cation o jues. rning world da ability to cation o jues. rning world da ability to ability to abi	nal ng, ure ned f tasets, els, and various ations nine ng s, and sing tial		
	PO1	PC	72	PO3	PO4	PO5	PO6	PO7		es in m oymen PO9		$\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ urse, students willhe foundational achine learning, ervised and learning, feature nd model abling informed application of chniques. e learning real-world datasets, the ability to a, train models, and nance using various ing practical ng skills. chical implications tions in machine cally examining bias, fairness, and $\checkmark$ , and proposing bitigate potential el development and $\boxed{010}$ $\boxed{P011}$ $\boxed{P012}$ $\checkmark$			
CO1	101	1 (	√	105	<u>10</u> ∓ ✓	105	100	107	<u>100</u> √	10)			<u>1012</u> ✓		
CO2	✓		✓	~	~	~	✓			~	$\checkmark$	✓	✓		
CO3	$\checkmark$		✓	✓	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	✓	$\checkmark$	✓	$\checkmark$		
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					concepts of data analytics using R										
					programming by explaining data										
					manipulation, visualization, and										
					<ul><li>basic statistical analysis.</li><li>Apply R programming techniques</li></ul>										
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IV	UNIX SYSTEM PROGRAMMI		<ul> <li>After studying this course, students will be able to:</li> <li>Explain the foundational concepts of Unix shell programming, demonstrating comprehension of shell commands, scripting, and utilities.</li> <li>Apply Unix shell programming skills to automate tasks, write shell scripts, and perform system administration tasks, showcasing practical proficiency in shell scripting.</li> </ul>							

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			RTIFIC ETWO		IEURA	ΔL	<ul> <li>After studying this course, students will be able to:</li> <li>Demonstrate comprehension of fundamental Artificial Neural Network concepts by explaining basic neural network architecture and components</li> <li>Apply critical thinking and analysis skills to evaluate and optimize ANN models for specifit tasks, showcasing an advanced understanding of neural network design principles.</li> <li>Synthesize advanced knowledge of deep learning and ANN techniques leading to the creation</li> </ul>								

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CO2	<ul> <li>✓</li> </ul>		✓	√		✓					✓	<ul> <li>✓</li> </ul>
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CO1 ✓	✓	<ul> <li>✓</li> </ul>	✓	✓		√	√	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
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CO3 🗸	<ul> <li>✓</li> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
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CO1	$\checkmark$		$\checkmark$		✓	$\checkmark$	✓		✓	✓	$\checkmark$	✓	$\checkmark$
CO2	$\checkmark$		$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$			✓	$\checkmark$	$\checkmark$	$\checkmark$
CO3	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
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<u>CO1</u>	PO1	PC		PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10 ✓	PO11 ✓	PO12
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	ì		✓	√	✓		√	✓	$\checkmark$	~	$\checkmark$
CO2	<ul> <li>✓</li> </ul>	`		<ul> <li>✓</li> </ul>	√	<ul> <li>✓</li> </ul>			~	<u> </u>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
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CO2	<b>√</b>		✓ √	<ul> <li>✓</li> </ul>	<b>√</b>	<b>√</b>	<ul> <li>✓</li> </ul>			<ul> <li>✓</li> </ul>	✓ √	✓ √	<ul> <li>✓</li> </ul>
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CO2	✓		$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$			$\checkmark$	$\checkmark$	✓	$\checkmark$
CO3	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
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CO1	▼ ✓	 ✓	<b>√</b>	• • •	• •	• •		•	✓ ✓	▼ ✓	• •	✓
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CO4	$\checkmark$	~	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$	<ul> <li>✓</li> </ul>
	νI		MPLO' KILLS			IENT		studyi le to:	ing this	course,	, student	s will

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CO1	~	$\checkmark$		<ul> <li>✓</li> </ul>	✓	✓		✓	✓	$\checkmark$		<ul> <li>✓</li> </ul>
CO2	✓ √		✓	✓ ✓		✓		✓			✓	✓ √
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		analyzing scalability, security, and cost considerations, making informed decisions to maximize the benefits of cloud computing.
VII	ADVANCED DBMS &	After studying this course, students will
, 11	NOSQL DATABASES	be able to:
	NOSQL DATABASES	<ul> <li>Remember and list the advanced concepts, data models, and terminology related to relational databases and NoSQL databases as covered in the course.</li> <li>Apply their knowledge of advanced database concepts to design, implement, and optimize complex database solutions, demonstrating their ability to choose appropriate database technologies and structures.</li> <li>Evaluate the strengths and limitations of relational databases and NoSQL databases and NoSQL databases in various application scenarios, comparing their performance, scalability, and</li> </ul>
		suitability for different types of
		data and workloads.
	O2 PO3 PO4 PO5 PO6	PO7         PO8         PO9         PO10         PO11         PO12
CO1 🗸		
CO2		
CO3 ✓		
VII	NATURE INSPIRED COMPUTING	After studying this course, students will be able to:
	COMPUTING	• Demonstrate proficiency in
		understanding and applying various Nature-Inspired
		Computing (NIC) techniques,
		including Genetic Algorithms,
		Swarm Intelligence, Artificial
		Neural Networks, and Quantum- Inspired Computing.
		<ul> <li>Apply NIC algorithms effectively</li> </ul>
		to real-world scenarios,
		optimizing solutions and
		achieving practical results in problem-solving.
		<ul> <li>Analyze, adapt, and innovate NIC</li> </ul>
		approaches, fostering critical
		thinking and research skills to
		address complex computational
		and optimization challenges.

	POI		D2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓	<ul> <li>✓</li> </ul>		√	√	✓		√	✓	✓	✓ <b>√</b>	<u> </u>
CO2		✓	✓	$\checkmark$	✓	$\checkmark$	√			√	~	✓	$\checkmark$
CO3		$\checkmark$	$\checkmark$	√	$\checkmark$	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	~	✓	$\checkmark$
VII       PROMPT ENGINEERING FOR CHATGPT       After studying be able to:         • Demon prompt apply th world a foundat         • Analyz engineer their ap practical probler         • Evaluat prompt design respons demons and pra develop         • PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       P												derstand g princip vely in re- showca of exper prompt ques, ev and creat showca d creativ cills. ballenges g, apply and prop	ling of oles and eal- asing a tise. aluate te using ve s in ethical
C01		I P	<u>02</u>	PO3	PO4	PO5 ✓	PO6 ✓	PO7	dem and deve	onstrat practic	al applie	utions, cal reaso cation in PO11	-
CO1		· √	·	√	 ✓	√	√			 ✓	 ✓	· · · · · · · · · · · · · · · · · · ·	· ·
CO3		~	~	$\checkmark$	✓	$\checkmark$	√	✓	√	✓	✓	✓	<ul> <li>✓</li> </ul>
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CO2	√		$\checkmark$	✓	✓	√	✓			✓	✓	✓	$\checkmark$
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CO3	√		$\checkmark$	✓	✓	✓	$\checkmark$	$\checkmark$	√	✓	✓	✓	$\checkmark$
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Faculty, is required to:         • understand the chosen technical topic and be able to summarize its key concepts, principles, and relevance within the context of the seminar.         • analyze the topic by gathering and synthesizing relevant information from various sources. They will then present their findings in a coherent and engaging manner, highlighting the main points, challenges, and potential applications of the chosen technical topic. They will identify potential areas for further research, discuss potential implications, and engage in thoughtful discussions about the topic's broader impact.         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12         CO1       ✓       ✓       ✓       ✓       ✓       ✓         VIII       MAJOR INTERNSHIP       After studying this course, students will be able to:       • Remember and list the essential policies, procedures, and guidelines of the organization as presented during the organization as presented		~		√	√	√	√	√	√	√	√	$\checkmark$	✓	√
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<ul> <li>their coursework to real-world projects within the organization, effectively implementing the skills and techniques relevant to their field of study.</li> <li>Critically assess their contributions to the organization's goals, evaluate the challenges faced during their internship, and propose recommendations for process improvements or innovative solutions.</li> </ul>		/111		M	AJOR	INTER	RNSHI	P	be ab	ole to: Rem polid guid pres and App thein proj effec and field Criti goal face prop	nember cies, pr lelines ented c training ly the l course ects wi ctively technic l of stu- ically a ributio s, evalu- d durin pose rec-	and list occedure of the or luring the g session knowled ework to thin the implem ques relea dy. ssess the ns to the uate the occomment provement	the esse es, and rganizat ne orient ns. lge gaine o real-we organiz enting ti evant to eir e organiz challeng internshi dations ents or	ential ion as ation ed from orld ation, he skills their zation's ges p, and

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## **DEPARTMENT OF COMPUTER SCIENCE ENGINEERING**

## **PROGRAMME SPECIFIC OUTCOMES (PSO):**

- PSO1: Programming and software development skills: Ability to employ modern computer languages, computing environments and standard practices for analysing, designing and developing optimal solutions to deliver quality software products.
- PSO2: Domain specific skills: Ability to apply techniques to develop computerbased solutions in various domains like Artificial Intelligence, Machine Learning, Network Engineering, Image Processing, Web Technologies, and Data Sciences.

## **COURSE OUTCOMES (CO):**

Semes	ter				Title	e				Cou	rse Out	comes	
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CO3		<b>√</b>	✓	✓	✓	✓	v	√</th <th>✓</th> <th>✓</th> <th><math>\checkmark</math></th> <th><math>\checkmark</math></th>	✓	✓	$\checkmark$	$\checkmark$
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CO2 CO3			PO3 ✓ ✓ RENEV ENVII	PO4 VABLE RONMI	PO5 ✓ ENER ENT A	PO6 ✓ ✓ GY, ND	P07	be able ● PO8 ✓ After str	to: To developsion basic control Things Underss IoT in of Mobile framew Demon sensors PO9	elop the oncepts of tand the comparis -to-Mob york. strate de and end PO10 ✓ ✓ ✓ this cour	knowled of Internet concept of on with ile vices like points. PO11 V se, stude nd the N and scope	ge of et of of PO12 $\checkmark$ $\checkmark$ nts will eed, e of non-
CO2 CO3			PO3 ✓ ✓ RENEV ENVII	PO4 VABLE RONMI	PO5 ✓ ENER ENT A	PO6 ✓ ✓ GY, ND	P07	be able ● PO8 ✓ After str	to: To develoant basic constraints Unders IoT in of Mobile framew Demon sensors PO9 V Unders IoT in of Mobile framew Demon sensors PO9 V Unders IoT in of Mobile framew Demon sensors IoT in of IoT in of Io	elop the oncepts of tand the comparis -to-Mob vork. strate de and end PO10 $\checkmark$ $\checkmark$ this cour Understa ortance a ventiona	knowled of Internet concept of on with ile vices like points. PO11 V se, stude and scope l and alte	ge of et of of PO12 $\checkmark$ $\checkmark$ nts will eed, e of non-
CO2 CO3			PO3 ✓ ✓ RENEV ENVII	PO4 VABLE RONMI	PO5 ✓ ENER ENT A	PO6 ✓ ✓ GY, ND	P07	be able ● PO8 ✓ After str	to: To develoant basic controls Unders IoT in of Mobile framew Demon sensors PO9 V V udying to: To l imp controls energy	elop the oncepts of tand the comparis -to-Mob vork. strate de and end PO10 $\checkmark$ this cour Understa ortance a ventiona rgy resou	knowled of Internet concept of on with ile vices like points. PO11 V se, stude nd the N and scope I and alte urces.	ge of et of of PO12 $\checkmark$ $\checkmark$ nts will eed, e of non-
CO2 CO3			PO3 ✓ ✓ RENEV ENVII	PO4 VABLE RONMI	PO5 ✓ ENER ENT A	PO6 ✓ ✓ GY, ND	P07	be able ● PO8 ✓ After str	to: To develoant basic controls Unders IoT in of Mobile framew Demon sensors PO9 V V udying to: To l imp controls enert	elop the oncepts of tand the comparis -to-Mob vork. strate de and end PO10 $\checkmark$ this cour Understa ortance a ventional rgy resou	knowled of Internet concept of on with ile vices like points. PO11 V se, stude nd the N and scope l and alte urces. nd role	ge of et of of $\mathbf{PO12}$ $\mathbf{\checkmark}$ $\mathbf{\checkmark}$ nts will eed, e of non- ernate
CO2 CO3			PO3 ✓ ✓ RENEV ENVII	PO4 VABLE RONMI	PO5 ✓ ENER ENT A	PO6 ✓ ✓ GY, ND	P07	be able ● PO8 ✓ After str	to: To develoant basic conditions Underss IoT in of Mobile framew Demon sensors PO9 V V udying to: To V imp com ener To v sign	elop the oncepts of tand the comparis -to-Mob vork. strate de and end PO10 ✓ ✓ ✓ this cour Understa ortance a ventiona rgy resou understan	knowled of Internet concept of on with ile vices like points. PO11 V se, stude nd the N and scope I and alte urces.	ge of et of of $\mathbf{PO12}$ $\mathbf{\checkmark}$ $\mathbf{\checkmark}$ nts will eed, e of non- ernate energy,

										•	plar and of e	nts and g	and the co	l energy
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PO12
	CO1	•			√	<ul> <li>✓</li> </ul>	√			✓	✓	√	✓	$\checkmark$
-	CO2	`		✓	<ul> <li>✓</li> </ul>	✓	<b>√</b>		_		~	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
	CO3 II	, 		1 ✓ ATION	✓	✓	✓			✓	√	✓	✓ se, stude	✓ ✓
										•	electric energy specific Safely trouble system perform Implen upgrad measur solar	e systems requiren c operate, shoot so s, ensurin nance. nent nece es, and li res to pro	esign sola s, conside nents and factors. maintain lar electr ng optim essary rep ife extens olong the stems and	ering l site- , and ic al pairs, sion life of
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PO12
-	CO1	•		1	<b>√</b>	<b>√</b>	<b>√</b>			√	√	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
	$\frac{\text{CO2}}{\text{CO2}}$	`			✓ ✓	✓ ✓	✓ ✓				✓ ✓	✓ ✓	✓ ✓	✓ √
	CO3 II		/ <b>v</b>	WASTI	T MAN	▲ GEM	▼ FNT		• 	v fter sti	v	<b>v</b> this cour	<b>v</b> se, stude	v nts will
						e able • •	to: Descrift comput Evalua and dis approp for spe- Analyz waste r integra circulat	be recent tation tec te variou posal me riate tech cific was the and pro- nanagem ting the p	trends in chnologie s waste t ethods an iniques te types. opose sus nent strate principle ny and ex	the es. reatment d select stainable egies s of the				
┢╴		PO1	PO2	PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PO12
	CO1		$\sqrt{102}$	/	√	105 ✓	100 ✓		$\uparrow$	√	<u>10</u> ) √	<u>1010</u> ✓	<u>1011</u> ✓	√
-	CO2	,	∕ √	<ul> <li>✓</li> </ul>	√	√	√				√	✓	✓	$\checkmark$
11	CO3	•	/ ✓	1 🗸	√	✓	✓	·	✓	$\checkmark$	✓	<ul> <li>✓</li> </ul>	✓	✓

Π		Ε	EME		G APPL FECHN			F		• able	to: Explair applica medicin and env Critical potentia associa biotech	the prin tions of l ne, agricu vironmer ly evalua al benefi ted with nologica	se, stude aciples ar biotechno ulture, in atal conse ating the ts and ris the use o il n various	nd plogy in dustry, ervation. ks of
	PO1	PC	02	PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PO12
CO1		1	✓		✓	√	✓			$\checkmark$	✓	✓	<ul> <li>✓</li> </ul>	✓
CO2			$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
П				TE	JCTION CHNO	LOGY			b	• •	to: Explair drones various Identify drones function Apply of practica real-wo	the diff and their industri the key and com nalities. drone tec al scenar orld chall	compon prehend chnology ios to ad enges.	es of ions in ents of their in dress
	PO1	PC		PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PO12
CO1			✓ ✓		✓	√	✓			✓	<ul> <li>✓</li> </ul>	<u>√</u>	✓ ✓	✓
CO2		× 	✓ √	• •	• •	√ √	• •				V	• •	×	✓
CO3		<u> </u>			<b>v</b> ICATIO			T	~	•	•	•	•	•
					ENGL		,		•	appropriation situation To under purpose To develop of the f	riately in ns. erstand H e across t elop and our lang g, Listen	e effectiv real-life English fa the curric integrate uage skil ing, Spea	or study culum. e the use ls i.e.	
	PO1	PC	02	PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PO12
CO1			✓		✓	√	✓			$\checkmark$	<b>√</b>	✓	<ul> <li>✓</li> </ul>	✓
CO2	•		✓ ✓	✓	<ul> <li>✓</li> </ul>	✓	<ul> <li>✓</li> </ul>					<u>√</u>	✓ ✓	✓
CO3		<b>~</b>	✓ C	✓ ONSTI	✓ TUTIO	✓ N OF I	✓ NDIA			√ ● [	✓ Fo gaiı	$\sim$ n the k	✓ nowledg	✓ e about
										] • 7 1	Indian c Fo und	onstituti erstand nd dutie	on. the fund	damental n Indian

								e	Fo ider ethical society.	ntify ind respon		role and towards
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	✓		✓	√	✓		✓	✓	$\checkmark$	✓	$\checkmark$
CO2	$\checkmark$	✓	✓	✓	$\checkmark$	$\checkmark$			✓	~	$\checkmark$	✓
CO3	√	$\checkmark$	$\checkmark$	$\checkmark$	√	$\checkmark$	~		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
II		SAM				ADA –	· II					
II			SA	ANSKR	IT - II							
III		DISC		MATH APH TI		ICS AN	D	•	princip predica Analyz perform involvi prime modula Apply and gen solve c	les of pro- te logic e profici- ning calc ng integ- ar arithm partition herating ombinate- alyze the	culations ers, inclu facto	ding rization, iques s to olems
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\checkmark$	✓		$\checkmark$	$\checkmark$	$\checkmark$		√	✓	$\checkmark$	✓	$\checkmark$
CO2	√	✓	✓	✓	√	✓			✓	✓	✓	✓
CO3	✓	✓	✓		✓	✓ √	•		<b>√</b>	✓	✓	✓
III			DATA			0 - 1		• •	to: Unders structur algorith and sor Analyz comple algorith analysi Apply dynami	tand the res, oper nms and ting ope e the con exity of d mms usin s. the greec ic progra	types of ations, an apply sea rations o mputation lifferent g asympt dy paradi umming a n algorith a calls for	data nd arching n files. nal cotic gm and and nmic
CO1	PO1	PO2	PO3	PO4	PO5 ✓	PO6 ✓	PO7	PO8	PO9	PO10 ✓	PO11 ✓	PO12

CO3	v	< ✓	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	$\checkmark$	√	<ul> <li>✓</li> </ul>	✓	✓	✓	$\checkmark$
III	PO1	PO2	OOF PO3	PO4	G JAV	A PO6		be able •	to: Unders concep Develo solve re Java. Apply a comp with us event-b	stand the ts and JA op compu- eal world simple G outer prog sers and u based GU les using	e, the stud object-o: AVA. ater progra l problem GUI interf gram to i understar JI handlin g Applets	riented rams to ns in faces for nteract nd the ng
CO1	<u>101</u>		105	<u>10</u> ∓ √	<u>105</u> √	100 √	107	100	<u>10</u> ,∕	1010	<u>1011</u> ✓	√
CO1	v		<ul> <li>✓</li> </ul>	· · ·	√	✓			√	· ✓	√	$\checkmark$
CO3	v	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	√	~	√	<ul> <li>✓</li> </ul>	✓	✓	✓	$\checkmark$
			MICRO						<ul> <li>Desinter with mide with mide</li> <li>An dess mide syss mode</li> <li>Ab corr sime bass corr apprarce mide fiel</li> </ul>	erfacing of h microp crocontro alyze, co ign and s croproces tems use nitoring. ility to an nprehence nulate mi ted system trol and preciate a hitecture croproces d.	emprehen simulate ssor-base ed for cor nalyze, d, design crocontro ms used f monitori advanced evolving ssor	eral and d, d atrol and oller- for ng, g
CO1 CO2 CO3 III	PO1 *		PO3	PO4 ✓ ✓ OMMU	PO5	PO6		be able	to: Unders	tand basi	ic Data	PO12 ✓ ✓ ✓ ents will

								•	Analyz Models Media. Apply t and Sw	e the diff and Tra the differ ritching T on and C	& Topol ferent Ne nsmissio rent Mult Cechniqu Correction	twork n iplexing es. Error
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u> </u>	<u> </u>	1.00	✓ ×	<u>100</u>	√	101	✓ V	<b>↓</b>	✓ ×	✓ ×	✓ ×
CO2	√	<ul> <li>✓</li> </ul>	√	~	√	✓			√	$\checkmark$	✓	$\checkmark$
CO3	√	<ul> <li>✓</li> </ul>	√	~	√	✓	√	∕ √	√	$\checkmark$	✓	$\checkmark$
III		IT	INFRA	STRU	CTURE	E AND		After st	udying	this cour	se, stude	nts will
				NAGE				be able				
								•	Infrastr blocks. Analyz Storage security Apply of demonst	e the cor blocks concepts	f IT Buil npute an & storag to Server &	d
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	✓		$\checkmark$	$\checkmark$	✓		$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
CO2	√	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	$\checkmark$	~			$\checkmark$	$\checkmark$	✓	$\checkmark$
CO3	✓	1 🗸	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓	✓	$\checkmark$	$\checkmark$	$\checkmark$
IIIBUSINESS PROCESS FUNDAMENTALSAfter studying this course, students w be able to:• Understand and suggest improvements that will benefit organizational performance.• Understand and suggest improvements that will benefit organizational performance.• Analyze, implement and integration strategy for processes that leverages organizational and technical capabilities of an organization • To apply and improve Busines Processes in organizations.											enefit ace. acal ation. usiness	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	<b>√</b>		✓	√	✓		√	✓	$\checkmark$	✓	$\checkmark$
CO2	✓	√	✓	$\checkmark$	$\checkmark$	✓			✓	$\checkmark$	✓	$\checkmark$
CO3	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓	∕ √	$\checkmark$	$\checkmark$	✓	$\checkmark$
III		SUPI	PLY CH	After student be able	to: Unders	stand abo	se, stude out SCM rse & Ag	and				

										•	modeli	ze Mathe ing of Su informat	matical pply Cha tion syste	
	PO1		PO2	PO3	PO4	PO5	PO6	PO7	7	PO8	PO9	PO10	PO11	PO12
CO1	•	~	$\checkmark$		✓	$\checkmark$	$\checkmark$			$\checkmark$	✓	$\checkmark$	✓	$\checkmark$
CO2	•		✓	✓	✓	√	√				✓	✓	✓	✓
CO3	,	<u> </u>	✓ 		✓ HELL I		✓		✓	✓ • €	1.	✓	✓ se, stude	✓ ✓
									C	•	Explair system comma Analyz Progran process Apply t concep	, and use ands e the She mming co s fundam the	onstructs entals	
	PO1		PO2	PO3	PO4	PO5	PO6	PO7	7	PO8	PO9	PO10	PO11	PO12
CO1		~	<u>102</u> √	105	√	<u>105</u> √	√	107		<u>100</u> √	<u>10</u> ,∕	<u>1010</u> ✓	<u>1011</u> ✓	<u>1012</u> ✓
CO2	•	~	$\checkmark$	✓	$\checkmark$	√	√				✓	$\checkmark$	$\checkmark$	$\checkmark$
CO3		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
III		lî U	USINI NTELI ISING IOGNO	LIGEN( IBM	CE						cademy		dled by l	BM
III					YABIL						<b>•</b>	of this c	ourse, sti	idents
			ENHA	NCEM	IENT P (ESEP		AMME	2 -1	a		Underst		basic con /E ABIL	
													basic con SONIN	•
										İ		f VERB.	tory com AL	petency
											aptitude Quantit Reasoni	e papers of ative Abi ing and V	lacement covering ility, Log Verbal A	gical
											Learn d knowlee	omain sp dge	pecific	
											exams l	ike CAT	ous comj ', CMAT PSC, GP	, GATE,

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	~	√		√	√	√		√	√	✓	✓	✓
CO2	✓		<ul> <li>✓</li> </ul>	√	√	√			√	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3 III	- ✓	√	$\checkmark$	✓ TERNS	√	$\checkmark$	v		<b>√</b>	✓	✓ se, stude	<ul> <li>✓</li> </ul>
								• •	Remen policies guideli present and tra Apply from th world p organiz implen technic of stud Critica contrib organiz challen interns recomr	s, proced nes of th red durin ining ses the know eir cours projects v zation, ef penting th ues relev y. Ily assess utions to zation's g ges face hip, and nendatio rements of	vledge ga sework to within the fectively he skills vant to the s their the goals, eva d during	d zation as entation ined o real- e and leir field luate the their occess
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	<b>↓</b> √		√	√	√		√	✓	✓	✓	✓
CO2	~		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	√			<b>√</b>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3	✓						<b>v</b>		√ ∎lation	√ of this o	✓	√ vlanta
IV		BLC	OCK CH		1	•	able to: Demon blockcl explain distribu and con Apply skills to deploy applica showca in smar Critica blockcl analyzi and int conside decisio	astrate un hain fund ing key ited ledg nsensus i blockcha o design, decentra tions (D asing pra t contrace lly assess hain solu ng secur eroperab erations, ns to enh	Apps), ctical pro ct develo s and opt tions by ity, scala ility	ing of s by ology, oms. ology , and oficiency pment. imize bility,		

									blockcl	nain tech	nology.	
P	D1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	<ul> <li>✓</li> </ul>		~	✓	$\checkmark$		✓	✓	✓	✓	✓
CO2	√	<ul> <li>✓</li> </ul>	~	~	√	~			~	✓	✓	$\checkmark$
CO3	√	<ul> <li>✓</li> </ul>	√	$\checkmark$	√	√	v	∕ √	~	✓	✓	$\checkmark$
IV		DA	TABA	SE MA	NAGE	MENT		After st	udying	this cour	se, stude	nts will
				SYSTE	MS			• •	Unders concep manage explain models Apply of techniq manage practica databas manipu Critical databas perform transac ensure	ts of data ement sy ing relat , SQL, a database ues to de e databas al skills i se creation lation. Ily assess se solution nance, in tion man	stems by ional dat nd norma manager esign, quo es, show n data m on, and da s and opt ons by an dexing, a agement and relia	a alization. nent ery, and casing odeling, ata imize alyzing and
P	D1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	<ul> <li>✓</li> </ul>		√	✓	$\checkmark$		✓	$\checkmark$	✓	✓	$\checkmark$
CO2	√	<ul><li>✓</li></ul>	√	✓	✓	$\checkmark$			✓	$\checkmark$	✓	$\checkmark$
CO3	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	v	∕ √	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IV		C	COMPU	TER N	ETWO	PRKS		• •	to: Unders concep by expl archited commu Apply o princip and tro showca networt trouble Critical comput networt measur conside and reli	tand the ts of con aining n ctures, pr inication computer les to des ubleshoo sing pra- k configueshoo the configueshooting ly assess ter netwook k perform es, and s	rotocols, models. r networl sign, con ot networ ctical ski uration as s and opt s and opt orks by as nance, se calability o ensure a	ntal tworks and cing figure, k setups, lls in nd imize nalyzing ccurity

P	D1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\checkmark$	<ul><li>✓</li></ul>		~	✓	<ul> <li>✓</li> </ul>		✓	<ul> <li>✓</li> </ul>	✓	✓	$\checkmark$
CO2	√	<b>√</b>	✓	✓	√	<ul> <li>✓</li> </ul>			√	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
IV	✓	<ul> <li>✓</li> </ul>	✓ SIGN A	✓	✓	✓	~	<u>∕</u>	<b>√</b>	✓	✓ se, stude	<ul> <li>✓</li> </ul>
			AI	_GORI <sup>*</sup>	ΓΗMS			•	Unders concep analysi comple and alg Apply technic comput showca designi and ana Critica algoriti analyzi comple offs, ar advanc achieve	ts of algo s by exp exity, rec gorithmic algorithmic algorithmic ues to so tational p asing pra- ng effici alyzing the lly assess mic solu- ng time a exity, eva- ad impler ed data s	laining a urrence i paradig n design blve problems ctical ski ent algor heir corre s and opt utions by and spac uluating t menting structures re proble	esign and lgorithm relations, ms. , lls in rithms ectness. imize e rade- s to
P	D1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\checkmark$	<ul> <li>✓</li> </ul>		~	$\checkmark$	✓		√	<ul> <li>✓</li> </ul>	✓	✓	$\checkmark$
	<u>√</u>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	√	<ul> <li>✓</li> </ul>			<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	$\checkmark$
	~	✓		✓ DE EN	✓ CINET		~	∕ ✓	✓ vdvina	✓	✓	✓ vill
CO2       Image: CO2 <thimage: co2<="" th="">       Image: CO2</thimage:>												

									develop	oment ou	itcomes.	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	101		100	<b>1</b> ∪ 1	<u>100</u> ✓	√	107	<u> </u>	<u> </u>	✓ <b>1</b> 010	✓ ×	√ I 012
CO2	Ņ	∕ √	✓	$\checkmark$	✓	✓			✓	~	$\checkmark$	$\checkmark$
CO3	Ņ		✓	✓	✓	✓	v		✓	$\checkmark$	$\checkmark$	$\checkmark$
IV			MPUTI					• •	to: Unders concep organiz archited and inp Apply of princip digital practica and ass program Critical comput by anal bottlend patterns	tand the ts of con cation by cture, me out/outpu computer les to des circuits, al skills i embly la nming. Ily assess ter organ yzing pe ecks, ins es, and n s to achie ve hardw	explaini emory hid t system r organiz sign and showcas n logic d inguage s and opt ization s rformand	ental ng CPU erarchy, s. ation analyze ing lesign imize olutions ce cccess lent and
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	١			✓	✓	✓		✓	<ul> <li>✓</li> </ul>	✓ ✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2	\ \		✓ ✓	✓ ✓	✓ ✓	✓ ✓			✓ ✓	✓ ✓	✓ ✓	V 
IV		DA	TA AN PRO	JALYT DGRAM			• •	to: Unders concep R prog data ma and bas Apply I techniq analysi showca data cle analysi Critical commu insights patterns and effe	tand the ts of data ramming anipulati- sic statist R progra ues to pe s and vis using pra- caning, e s, and sta ng. lly evalua- nicate da s using R s, drawir ectively	erform da ualizatio ctical ski xplorator atistical	ental es using aining lization, ysis. ata n, lls in cy data n yzing usions, ng	

								decisio	n-makin	g.	
PO	l PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓ ✓		$\checkmark$	$\checkmark$	$\checkmark$		✓	<ul><li>✓</li></ul>	✓	✓	$\checkmark$
CO2	$\checkmark$ $\checkmark$	<ul> <li>✓</li> </ul>	✓	✓	✓			<b>√</b>	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO3	✓ ✓	<ul> <li>✓</li> </ul>	√	✓	✓	<b>v</b>	✓	✓	✓	✓	<ul> <li>✓</li> </ul>
IV		IED MO					• •	to: Unders concep Langua diagran elemen Apply and doo showca creating diagran diagran Critical UML n modeli consist feature effectiv	cument s using pra- g use cas ns, and s	fundame fied Moo L) by exp modeling otation. chniques oftware s ctical ski e diagran equence s and opt y analyzi es, diagra d modeli re clear a entation	ental deling blaining s to model systems, lls in ms, class imize ng am ng tool and
PO	1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\checkmark$ $\checkmark$		✓	✓	✓		<b>√</b>	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2 CO3	<u> </u>	<ul> <li>✓</li> </ul>	✓	✓	✓			✓ ✓	✓	✓ ✓	✓ ✓
IV	UNE	X SYST	ÈM PR	G	After st be able	to: Explain concep program compre- comma utilities Apply skills to shell so admini practica scriptin Critical shell so efficien script p informe	Unix she o automa cripts, and stration t al proficing. Ily evalua cripts by ney, erron portability ed decisi ttion and	ndationa x shell lemonstr of shell pting, an Il progra te tasks, d perforr asks, sho ency in s ate and c analyzin r handlin y, makin ons to er	ating d mming write n system owcasing shell ptimize g code g, and g		

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	Ņ	< ✓		$\checkmark$	✓	✓		✓	<ul><li>✓</li></ul>	$\checkmark$	$\checkmark$	$\checkmark$
CO2	١	∕ √	<ul> <li>✓</li> </ul>	✓	√	√			✓	<ul> <li>✓</li> </ul>	✓	$\checkmark$
CO3	<b>`</b>	$\checkmark$	_ √	$\checkmark$	$\checkmark$	√	<u> </u>		∫ √	✓	$\checkmark$	$\checkmark$
IV		INTRO BIG DA & ECO	ATA, H	ADOO					bject wi Academy		dled by ]	BM
IV		MINI P	ROJEC	T-1				After st be able	to: Apply softwar method implem applica specific Analyz mini-pr comple compose design efficien Evalua their A needs a problem critical limitati	programmere develop lologies to nent, and tion that c Problemere roject, br ex problements, an decision ney and u te the eff pplication and solving n. They ly assess ons of the	to design test a fu addresse n/Scenar uiremen eak dow ms into s d make i s to ensu usability. fectivene n in mee ng the ta will also	lls and , nctional es a io. ts of the n smaller nformed re ss of ting user rgeted agths and ion and
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	, ,	$\sqrt{}$		$\checkmark$	$\checkmark$	<ul> <li>✓</li> </ul>		✓	∫ √	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓
CO2	Ņ	$\checkmark$	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				$\checkmark$	$\checkmark$	✓
IV IV			MPLO ANCEM				2-2		to: Unders of QU Unders of LOO Skills Acquin compe REAS Solve aptitud Quanti	stand the ANTITA stand the GICAL F re satisfa tency in ONING campus p le papers itative Al	ourse, stu basic co ATIVE A basic co REASON ctory use of V placemer covering bility, Lc Verbal A	ncepts BILITY ncepts IING ERBAL ts g gical

								•	knowle Compe exams GATE GPSC	ete in var like CA , GRE, C etc.	rious con T, CMA' GATE, U	Г, PSC,
<u> </u>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1 CO2	✓ √	✓ ✓	√	✓ √	✓ ✓	<b>√</b>	~	✓	✓ √	✓ <b>√</b>	$\checkmark$	$\checkmark$
CO2 CO3	• •	· ·	• •	• •	• •		• •		· · · · · · · · · · · · · · · · · · ·	✓ ✓	✓ ✓	✓ ✓
CO4	√	<ul> <li>✓</li> </ul>				√			√		✓	✓
CO5	√	<ul> <li>✓</li> </ul>	✓	✓	✓	✓		✓	✓		✓	$\checkmark$
CO6	~	<ul> <li>✓</li> </ul>	✓	✓	$\checkmark$	$\checkmark$	~	<ul><li>✓</li></ul>	✓	$\checkmark$	✓ se, stude	$\checkmark$
								•	concep explain memor system Apply princip implem schedu and I/C Critical operati by anal utilizat and sec achievi	ts of ope ing proc y manag organiza operating les to de nent effic ling, men ) manage lly evalu ng systen lyzing re ion, conc curity me	ess mana ement, a ation. g system sign and cient proc mory allo ement str ate and c m perform source currency echanism ent and r	stems by agement, nd file cess ocation, ategies. optimize mance control, s for
CO1 CO2	PO1 ✓	PO2	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7	PO8 ✓	PO9 ✓	PO10 ✓	PO11 ✓	PO12 ✓
CO3	√	✓	✓	$\checkmark$	✓	✓	<b></b>		✓	✓	✓	$\checkmark$
V		AD	VANC	ED JAN	VA AN	be able	to: Unders concep technol framew enterpr archited Apply skills to enterpr showca	tand the ts of Jav logies by vorks, de ise appli cture. advanced o design ise-level asing pra	cation d Java an and deve applicat	d EE ng erns, and d J2EE elop ions, oficiency		

PO CO1 CO2 CO3 V	✓ ✓ ✓ ✓ ✓ ✓	PO3	PO4 ✓ ✓ STRUC	PO5 ✓ ✓ TURE	PO6 ✓ ✓ S - 2		PO8 ✓ After stu be able •	Critical Java an analyzi scalabi conside and eff solution PO9 V V udying to: Unders and ope Apply	ng perfo lity, and erations t icient en ns. PO10 $\checkmark$ this cour this cour tand the erations of Hashing,	security terprise s PO11 V se, stude basic pri of data st , Disjoint	PO12 PO12 V nts will nciples ructures. sets,
PO CO1	1 PO2 ✓ ✓	PO3	PO4	PO5	PO6 ✓	PO7	• PO8	advanc solving Analyz choose	ed Trees problen te the giv appropr	g techniq and Gra ns effecti ren scena iate Data lving pro	phs for vely. rio and
CO2	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	✓	✓			✓	✓	✓	$\checkmark$
CO3	<ul> <li>✓</li> </ul>	✓	$\checkmark$	$\checkmark$	$\checkmark$	<b>√</b>		$\checkmark$	√	$\checkmark$	$\checkmark$
V PO		NDAMI PO3	PO4	S OF A	J & MI PO6		After str be able • • PO8	to: CO-1: fundam artifici machin key pri applica CO-2: intellig learnin proble skills i model CO-3: optimi and ma analyz hyper p interpri	Understa nental co al intelli ne learnin inciples, ations. Apply a gence and ng techni ms, show n data pr training, Criticall ze artific achine le ing mode paramete etability ve and ac	oncepts o gence an ng by exj algorithr rtificial d machin ques to s vcasing p eprocess , and eva y evaluar tial intell arning m el perforn ers, and to achiev	f d olaining ns, and e olve ractical ing, luation. te and igence odels by nance,

CO1	✓	√	1	$\checkmark$	√	√		✓	✓	✓	✓	✓
CO2	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	√	√	√			√	$\checkmark$	$\checkmark$	$\checkmark$
CO3	✓	✓	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓	✓	$\checkmark$	$\checkmark$	$\checkmark$
V		NE1	WORK	AND I SECUR		MATIC		• •	to: Unders concep informa explain threats, Apply security implem archited Critical networ security risk ma and acc compre	tand the ts of netwation secuing secu and vult network y techniq nent secu ctures an lly assess k and inf y measure magement cess cont	rity princ nerabiliti and info	ental ciples, es. cmation esign and rk ols. imize alyzing ography, isure ctive
C01	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1 CO2	▼ ▼	▼ ▼ ✓	✓	✓ ✓	 ✓	v √		•	✓ ✓	 ✓	▼ √	▼ √
CO3	✓	<b>√</b>	<ul> <li>✓</li> </ul>	√	√	√	√	<ul> <li>✓</li> </ul>	√	$\checkmark$	✓	✓
V				WARE		be able At the e should b	to: nd of the period of the project of the project of the manage execute develop showca resource schedu Critical softwar process progress communication	te course to: tand the les of so ement by lifecycle inagemen software ement teo openent pr asing pra- te allocat ling. Ily evalu- re projec ses by an ss, stakef mication ement to	project chniques onitor sol ojects, ctical ski ion and ate and o t manage alyzing p nolder , and cha	lents intal oject ng ng, and to plan, tware lls in ptimize ment project nge		

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u>r01</u> √	102	103	r04	105	100	r0/	F08	109	F010 ✓	<u>r011</u> ✓	r012 ✓
CO1			~	· ·	· · ·	· ·		•	· · ·	· ·	· ·	· ✓
CO2 CO3			· ·	· ·	· · ·	· ·	~		· ·	· ·	· ·	· •
V		INTRO	DUCTI	ON TO	DATA	A SCIEI	NCE	After st	udving	this cour	se, stude	nts will
								• •	Unders concep explain visualiz statistic Apply of explore showca data cle basic m Critical commu insights drawing effectiv	ts of data ing data zation, an cal analy data scie e and ana using pra- eaning, v nodeling. Ily assess unicate data s by anal g conclu vely visu t informe	sis. nce techi lyze data ctical ski isualizat	by ation, niques to asets, 11s in ion, and n tterns, d esults to
<u> </u>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11 ✓	PO12
CO1 CO2	✓ ✓			<b>√</b>	<b>√</b>	√ √		✓	✓ 	✓ ✓	✓ ✓	✓ ✓
CO2 CO3	• •	• •	• •	• •	• •	 ✓	~		▼ ✓	• •	• •	▼ ✓
V       V												ental v ation, ata n, lls in oratory insights ta, sults, ng
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO1	v	✓		√	✓	✓		✓	✓	✓	✓	$\checkmark$
CO2	~	<ul> <li>✓</li> </ul>	✓	√	√	✓			✓	✓	✓	✓
CO3	~	<ul> <li>✓</li> </ul>	✓	$\checkmark$	√	√	√	<ul> <li>✓</li> </ul>	√	$\checkmark$	✓	✓
V		PRINC	CIPLES	DESIG		IERFA		• •	to: Unders princip design usercer guidelin Apply princip and intu showca informa interact Critical user int feedbac accessi ensure	tand the les of use by expla itered de nes. user inter les to cre uitive int ising pra- tion arcl ion desig ly assess erfaces b ck, usabi bility con	ctical ski hitecture gn. s and opt by analyz lity testir nsideratio and eng	ental ce ability, l design ign friendly lls in and imize zing user ng, and ons to
	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11	PO12	
CO1	v			√	√	PO6 ✓		√	∕	<u>√</u>	<b>√</b>	✓ ×
CO2	V	< ✓	✓	$\checkmark$	√	✓			✓	✓	✓	✓
CO3	~	∕ √	✓	$\checkmark$	√	$\checkmark$	√	∕ √	✓	$\checkmark$	✓	$\checkmark$
v			NCEME	USIN LITY S ENT	Skills A On com are able	<ul> <li>cademy</li> <li>pletion</li> <li>to:</li> <li>Una con</li> <li>QU</li> <li>Una con</li> <li>RE.</li> <li>Accon</li> <li>Con</li> <li>VE</li> <li>Sol</li> <li>apti</li> <li>Qua Abi</li> <li>Lea kno</li> <li>Con</li> </ul>	of this co derstand cepts of ANTITA derstand cepts of ASONIN quire sati npetency RBAL R ve camp itude pap antitative asoning a lity urn doma owledge npete in	ATIVE A the basic LOGICA NG Skills isfactory in use o REASON us placer pers cove e Ability, and Verb	adents BILITY AL f ING nents ring Logical al ic			

										T, CMA TE, UPS		
		T						1	1	-		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓	✓	✓	✓	√	v		✓		<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2	<b>√</b>	✓ ✓	✓	✓	✓		v	/ /	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓
CO3	✓	✓	<b>v</b>	✓	V		v	✓ ✓	✓	✓	✓ ✓	✓
CO4	✓					√			✓		$\checkmark$	$\checkmark$
CO5	<b>√</b>		✓ ✓	• •	✓ ✓	• •		✓ ✓	v	✓	▼ ✓	×
CO6	√	•		▼ FERNS		v	• 	A ft on ot	V	this cour		<b>v</b>
								• •	Remen policies guideli present and tra Apply from th world p organiz implen technic of stud Critica contrib organiz challen interns recomr	ed durin, ining ses the know heir cours projects v vation, ef henting the ues relev y. Ily assess utions to vation's g ges face hip, and nendatio rements of	lures, and e organiz g the orig sions. vledge ga sework to within the fectively he skills vant to the s their the goals, eva d during propose ns for pr	d zation as entation uined o real- e and heir field luate the their occess
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	101	102	105	· · · · · · · · · · · · · · · · · · ·	105	100	10/	100	√	1010 ✓	1011 ✓	1012
CO1	✓		✓	✓	✓	$\checkmark$			√	√	✓ <b>√</b>	✓
CO3	√	<ul> <li>✓</li> </ul>	✓	✓	✓	√	v	∕ √	✓	√	✓	$\checkmark$
VI		ADV	ANCEE	) WEB	TECHI	NOLOO	GΥ	After st	udying	this cour	se, stude	nts will
								be able	to:			
								٠	0	nize and		
										nental co		
										nents of a	advanced	1 web
								•	technol Constru	logies. uct novel	weh	
								•		tions that		orate
										ed techn		
									in the c	course, de	emonstra	ting the
										to transfe		edge to
								-		orld situa		2
								•	•	e and ev lity of va		
L									sundoll	ity of va	iious we	U

									needs, decisio	leading t	r specific o inform g and the choices.	ed
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u>101</u> √	<u>102</u> √	105	<u>10</u> 1	105	<u>100</u> ✓	107	<u>100</u>	<u> </u>	√	<u>1011</u> √	<u>1012</u> ✓
CO2	√	 ✓	√	√	√	✓			√	✓		✓
CO3	√	<ul> <li>✓</li> </ul>	√	√	√	√	``		√	✓	✓	✓
VI		S	YSTEM COM	I SOFT PILER				be able	to: Demon of softw princip founda Apply practica softwar basic co progran Analyz softwar compil- evaluat	astrate an ware and les by ex tional co theoretic al scenar re system ompilers nming la te and op re system ers, throu	al knowl ios by de is and de for inguages timize co is, incluc ugh critic informed	anding r design their edge to esigning veloping omplex ling cal
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\checkmark$	√		√	√	✓		✓	√	✓	✓	$\checkmark$
CO2	√	<ul> <li>✓</li> </ul>	✓	√	$\checkmark$	✓			√	✓	$\checkmark$	$\checkmark$
CO3		✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	v	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
VI       INTERNET OF THINGS         After studying this course, students will be able to:         • Demonstrate an understanding of IoT concepts and protocols by explaining their principles and functionalities.         • Design and develop IoT solutions by applying knowledge of sensors, communication protocols, and data processing techniques.         • Evaluate and strategize IoT architectures for specific use cases through critical analysis, considering security, scalability, and integration aspects.												
	DOI	DOC	DOC		D0-7		DOT	DCC	DOC	DOIO	DOII	DOIT
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	<b>↓</b>		<b>√</b>	✓	<b>√</b>		<b>√</b>	<b>√</b>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2			✓		- √				· ./		$\checkmark$	

CO3	~	<b>√</b>	✓	✓	$\checkmark$	$\checkmark$	,	<b>/</b>	√	✓	√	✓		$\checkmark$
VI		BI	USINE:	SS INT	ELLIG	ENCE				to: Underst concept by expl data mi techniq Apply b techniq visualiz practica transfor (ETL) p Critical busines analyzin design, systems	business ues to an a data, si al skills in mation, processes ly assess s intellig and data q and deci s to enham	fundame ness inte ata warel d reportin intelligen alyze an howcasin n data ex and load s. and opti gence solution juality, d sion sup nce infor	ntal Illige nousi ng trace d ng tract ing mize ution ashb port	nce ng, ion, e us by oard
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	'	PO8	PO9	PO10	PO11	PC	012
CO1		✓ <b>√</b>		✓	✓	✓			✓	√	✓	✓		$\checkmark$
CO2	√	<b>√</b>	$\checkmark$	✓	√	✓				✓	<b>√</b>	<ul> <li>✓</li> </ul>		<b>√</b>
CO3	<b>√</b>		✓				<u> </u>	✓ _	√ €	<u>↓</u> √	✓			✓
VI				CTION			3		e able                                   	to: Remem busines theories covered Apply t busines to analy develop address challeng Evaluat approac strength various recomm	this cour ber and 1 s manage s, and key l in the c heir under s manage vze case s o effectiv ing real- ges. e differe thes, con as and we business nend suit ing busin	list funda ement co y termino ourse. erstandir ement pr studies a e strateg world bu nt manaş nparing t eaknesse s context able stra	amen ncep blogy g of incip nd ies fo sines geme heir s in s, and tegie	ttal ots, / oles or ss ent d s for
CO1	PO1 ✓	PO2	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7	'	PO8 ✓	PO9 ✓	PO10 ✓	PO11 ✓	PC	012 ✓

CO2	,	∕ √	$\checkmark$	✓	√				$\checkmark$	$\checkmark$	✓	✓
CO3	,	<ul> <li>✓</li> </ul>	$\checkmark$	$\checkmark$	$\checkmark$	v	/	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
VI			ODUC EPREN					e able t • R er te cl er co • U pr er id as in • A vo fa on st	to: ememb ntreprer erminole haracter ntreprer ourse. Indersta rinciple xplainir lentifyin ssessing n the ma nalyze entures, nctors the r failure	er and li neurship ogy, and istics of neurs dis nding of s of entro g the pro- ng oppor g risks, as urket. real-life , criticall nat contri e, and ide s that we	successf cussed ir f the key epreneur ocess of	ial iul i the ship by ng value neurial ting the success the
CO1 CO2 CO3 VI		PO3	PO4	PO5	PO6 ✓ ✓	P07	A	e able t • R fu m us pp • A tec co pn al m • E lii rec th pr	to: ememb indame aethodo sed in o resented pply op echnique omplex roblems bility to nethods valuate mitation esearch neir app roblem	er and li ntal cond logies, a peration d during perations es to mo- real-wor s, demon choose and inte- the stren ns of diff techniqu licability scenario		nologies h, as se. olve ization heir ate results. l erations paring us pposing

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	~	√		✓	√	√		✓	✓	✓	✓	$\checkmark$
CO2	~	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	√	√			√	✓	✓	$\checkmark$
CO3	~	$\checkmark$	_ √	$\checkmark$	$\checkmark$	√	√	<ul><li>✓</li></ul>	<ul> <li>✓</li> </ul>	✓	se, stude	$\checkmark$
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	V	<ul><li>✓</li></ul>		$\checkmark$	$\checkmark$	✓		$\checkmark$	✓	✓	✓	$\checkmark$
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2	√	<ul> <li>✓</li> </ul>	✓	✓	√	√			✓	$\checkmark$	✓	$\checkmark$
CO3	√	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	<b>v</b>	∕ √	∫ √	✓	$\checkmark$	$\checkmark$
VI		DEE	r leai	<b>KINING</b>	IECH	NIQUE	20	After st be able	to: Demon of foun learnin princip Apply to solve designi neural various Analyz learnin assessm choices training	astrate an idational g by exp les and n deep lear e comple ng and in network s tasks. g models nent of a s, hyperp	se, stude understa concepts laining k nethodol ming tech x problex mplemen models f timize de s through rchitectu arameter es to ach rmance.	anding in deep ey ogies. miques ms by ting or eep critical re s, and
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		<b>√</b>		✓	√	✓		<b>√</b>	✓	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>
CO2 CO3	✓ √	✓ ✓	✓ √	✓ √	✓ √	✓ √			✓ ✓	✓ ✓	✓ ✓	✓ ✓
VI       ARTIFICIAL NEURAL NETWORKS       After studying this course, students will be able to:         •       Explain the fundamental principles of artificial neural networks, showcasing comprehension of their basic components and functioning.         •       Apply artificial neural network architectures to solve diverse problems, demonstrating the ability to design and train networks for various tasks.         •       Critically assess and optimize artificial neural network performance by analyzing activation functions, network topologies, and training algorithms to achieve advanced												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u>101</u> √	102		- <u> </u>	√	√	/	√	<u> </u>	√	√	<u> </u>
CO2	$\checkmark$	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$			✓	✓	$\checkmark$	$\checkmark$

CO3		$\checkmark$	~	$\checkmark$	$\checkmark$	✓	v	∕ √	√	√	✓	$\checkmark$
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CO1	PO1	2O2 ✓	PO3	PO4 ✓	PO5 ✓	PO6 ✓	PO7	PO8 ✓	PO9 ✓	PO10 ✓	PO11 ✓	PO12 ✓
CO2	,	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓			~	✓	$\checkmark$	$\checkmark$
CO3 VI		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓ SYSTE	v	$\checkmark$	$\checkmark$	$\checkmark$	✓ se, stude	$\checkmark$
								•	Demon of emb princip fundan compo Apply method functio showca hardwa Critica embedd by anal constra protocc consun optima	edded sy les by ex- nental co- nents. embedded lologies nal and e asing pra- are-softw lly assess ded syste lyzing re uints, con ols, and p nption fo l system	to develo efficient s ctical ski vare integ s and opt ems perfo source nmunicat power r achievi design.	sign ad as design p systems, lls in ration. imize ormance ion ng
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VI			MI	NI PRO	JECT-2	2		be	<ul> <li>able t</li> <li>App soft met imp app Pro</li> <li>Ana min prol and to e</li> <li>Eva App and The stre solu</li> </ul>	o: bly prog ware de hodolo lement lication blem/S ilyze th i-proje blems i make i nsure e luate th blication solving ey will a ngths a	grammin evelopme gies to de , and test that add cenario. e require ct, break nto small nformed fficiency he effecti n in mee g the targ also critic nd limita d propos		nd onal specific f the omplex onents, lecisions bility. f their needs blem. ess the their
	PO1		PO3	PO4	PO5	PO6	PO7	F	PO8	PO9	PO10	PO11	PO12
CO1 CO2	,	$\sqrt{\sqrt{2}}$		✓ ✓	✓ ✓	✓ ✓			✓	✓ ✓	✓ ✓	$\checkmark$	✓ ✓
CO2	,	$\sqrt{\sqrt{1}}$	· ·	· •	· ~	· ~	v		✓	· •	· √	· ✓	· •
VI			MPLO ANCEM			2 -4	be	<ul> <li>able t</li> <li>Unc QU</li> <li>Unc LOG</li> <li>Acc use</li> <li>Solt pap Abi Ver</li> <li>Cor exa</li> </ul>	o: derstand ANTIT derstand GICAL juire sa of VEF ve camp ers cov lity, Lo bal Abi npete in ms like	d the basi CATIVE I the basi REASC tisfactor RBAL RI pus place ering Qu ogical Re ility n various CAT, C	se, stude ic concep ABILIT ic concep DNING S y compet EASONI ements ap antitativ asoning s competi MAT, G C, GPSC	ots of Y ots of kills ency in NG otitude e and tive ATE,	
	PO1	PO2	PO3	PO4	PO5	PO7	F	PO8	PO9	PO10	PO11	PO12	
CO1 CO2			✓	✓ √	✓	✓ √		-	✓	✓	✓	✓	✓ ✓
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VI		SELF	-MOTI	VATED	PROC	GRAMN	ЛE	are	e able • Imp • Acc	to: prove le	arnabilit ditional	•	idents ge in the

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PC	)1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	<ul> <li>✓</li> </ul>		✓	$\checkmark$	✓		✓	$\checkmark$	√		<ul> <li>✓</li> </ul>
CO2 CO3	✓ ✓	✓	✓	✓ ✓	~	✓			~		✓	✓ ✓
CO3	• √	•		• • ✓	v	~	 ✓	•	v			✓ ✓
CO5	√		✓	✓		✓		✓		√	✓	
VII	se, stude inderstan fundame oncepts, s oyment r iputing sl nd mana oud owcasing ncy in ut and optir tions by lity, secu ns, makin ns to mai oud comp	ding of entals by service nodels. cills to ge g ilizing nize nize urity, and ng simize										
PC	)1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2	<u>√</u>		✓	✓		✓					✓	<ul> <li>✓</li> </ul>
CO3 VII	√ ⊤	✓		$\checkmark$	$\checkmark$		<u> </u>	✓ After str	√ Idving	this cour	se, stude	✓ ✓
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
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CO2	~		✓	✓		✓					~	<ul> <li>✓</li> <li>✓</li> </ul>			
CO3 VII	•			TA AN		TCS	•	A ftor st	v	this cour	se, stude	v nto will			
	<ul> <li>Explain the foundational concepts of big data analytics, demonstrating comprehension of data volume, variety, velocity, and veracity challenges.</li> <li>Apply big data analytics techniques to process, analyze, and extract insights from large and complex datasets, showcasing practical skills in data manipulation and analysis.</li> <li>Critically evaluate and optimize big data analytics processes by analyzing data preprocessing, algorithm selection, and scalability considerations to achieve meaningful and actionable insights.</li> <li>PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 CO1 </li> <li>CO1 </li></ul>														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
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	✓		✓	✓		✓					✓	✓			

							-	ctical aj elopme	pplication ent	n in AI				
POI	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
~~	$\sqrt{102}$	105		<u>105</u> √	100	107	100 ✓	<u>10</u> ,∕	<u>1010</u> ✓	1011	√			
CO2	✓	√	<ul> <li>✓</li> </ul>		√					✓	✓			
CO3	✓ ✓		<ul> <li>✓</li> </ul>	√		√	<ul> <li>✓</li> </ul>	~			✓			
VII	NATU	RAL LA	NGUA	GE	1		After stu	ldving	this cour	se, stude	nts will			
VII	PROCESSING       be able to:         • Explain the fundamental concepts natural language processing (NLP demonstrating comprehension of text processing, linguistic analysis and NLP applications.         • Apply NLP techniques to process and analyze textual data, showcasing practical skills in task such as sentiment analysis, named entity recognition, and text classification.         • Critically evaluate and optimize NLP models by analyzing performance metrics, feature engineering, and language model selection, making informed decisions to enhance the quality or NLP solutions.         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO1													
POI	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1	✓ ✓		✓	✓	√		<ul> <li>✓</li> </ul>	✓	$\checkmark$		$\checkmark$			
CO2	✓	√	✓		√					✓	$\checkmark$			
CO3	<ul> <li>✓</li> </ul>		$\checkmark$	$\checkmark$		√	✓	$\checkmark$			$\checkmark$			
CO2 ✓ ✓ ✓ ✓ ✓ ✓														

									probler	n-solving	g outcom	nes.
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	$\checkmark$	✓		$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	√	$\checkmark$		$\checkmark$
CO2	√		✓	~		✓					✓	$\checkmark$
CO3	√	<ul> <li>✓</li> </ul>	MPUT	$\checkmark$	$\checkmark$		v	∕ ✓	<ul> <li>✓</li> </ul>		se, stude	$\checkmark$
<ul> <li>Explain the fundamenta concepts of computer g and visualization, demo comprehension of graph rendering, modeling, ar visualization technique.</li> <li>Apply computer graphi visualization skills to cr manipulate visual context showcasing practical print 2D and 3D graphics and animation.</li> <li>Critically assess and op visualizations by analyze representation, visualizations by analyze representation, visualize techniques, and user intimaking informed decisition enhance the clarity and effectiveness of visual communication.</li> <li>PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 CO1 v v v v v v v v v v</li> </ul>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<u> </u>	<u>10</u> 2 √	100	<u>↓</u>	√	✓	101	√	√		1.011	✓ ×
CO2	√		√	~		√					✓	✓
CO3	$\checkmark$	<ul> <li>✓</li> </ul>		$\checkmark$	✓		v	∕ √	✓			$\checkmark$
<ul> <li>VII SOCIAL AND WEB ANALYTICS</li> <li>After studying this course, students will be able to: <ul> <li>Understand the foundational concept of social and web analytics by explaining data collection methods, metrics, and tools.</li> <li>Apply social and web analytics techniques to analyze and interpret online user behavior and engagement patterns.</li> <li>Critically assess and optimize social and web analytics strategies by analyzing insights, refining metrics, and making informed decisions to enhance digital marketing and user experience.</li> </ul> </li> </ul>												concepts y ethods, ics terpret agement e social by netrics, ons to
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

	CO1	v	<		√	√	√		✓	√	✓		✓	
	CO2	v		√	√		√					✓	$\checkmark$	
	CO3	v	✓ ✓		√	√		√	<ul> <li>✓</li> </ul>	√			✓	
												d mobili	ty	
Ī		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8			PO11	PO12	
	CO1	~	∕ √		√	√	✓		✓	√	$\checkmark$		$\checkmark$	
	CO2	٧		✓	√		√					✓	$\checkmark$	
	CO3 VII			SOFT	<b>√</b> WARE	✓ TESTI	NG		• •	to: Underss princip explain method testing Apply : techniq test cas skills in ensurin Critical softwar analyzi automa	software jues to de jues, show n identify g softwa lly assess re testing ng test c ition stration ion testir ve softwa	fundame ftware te ng techniqu testing esign and casing p ving defe re qualit s and opt g process overage, tegies, an ng to ens	es, and es, and execute ractical cts and y. imize es by nd ure	
			1			DOF	DOC	<b>DO7</b>	<b>D</b> 0 0	DOO	5010		1	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
	CO1	PO1 •		PO3	PO4 ✓	P05 ✓	P06 ✓	PO7	PO8 ✓	P09 ✓	PO10 ✓	PO11	PO12 ✓	

CO3	✓	<b>√</b>		✓	√		$\checkmark$	$\checkmark$	✓			$\checkmark$
VI				PUTER			ł	e able i	to: Explain concep demons image j extracti recogni Apply of techniq interpre- practica image s tracking Critical comput analyzi and con making improv reliabil	the four the four strating c processir ion, and c ition tech computer ues to ar et visual al skills i segmenta g, and fa lly assess ter visior ng accur nputation g informe e the qua ity of vis	nniques. r vision halyze an data, sho in tasks s ation, obj cial reco s and opt n models acy, robu nal effici ed decisio ality and sual analy	d wcasing uch as ect gnition. imize by ustness, ency, ons to
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<u>CO1</u>	✓	<b>↓</b> ✓		✓	✓	<ul> <li>✓</li> </ul>		✓	✓	✓		✓ ✓
CO2 CO3	✓ ✓		<b>√</b>	✓ ✓		<b>√</b>	✓				✓	$\checkmark$
VI	I		ADVAN ARO	ICED C CHITE				• •	to: Explain of com- demons pipelini and par techniq Apply a archited and ana comput practica instruct memor Critical comput analyzi perform consum making enhanc	the adv puter arc strating c ing, men allel pro ues. advanced cture prin alyze hig ting syste al skills i tion pipe y access lly evalue ter archit ng trade- nance, po nption, an g informe e the effi-	nory hier cessing d comput nciples to h-perform ems, show in optimi lines and patterns, ate and o ectures b -offs in	ncepts onsion of archy, er o design nance wcasing zing ptimize y ility, ons to nd

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2	√		√	✓		√					✓	$\checkmark$
CO3	√	<ul> <li>✓</li> </ul>		✓	√		~	<ul> <li>✓</li> </ul>	✓			$\checkmark$
VII			AR	CHITE	CTURE	Ξ		•	Unders princip archited explain compor Apply s archited and dev interop using w Critical service evaluat orchest conside	les of sen cture (SC ing its ko nents, an service-oc cture prin velop mo erable so veb servi lly analyz -oriented ing servi ration, an erations f	ey conce d benefit oriented nciples to odular an oftware s	ented pts, s. o design d ystems otimize etures by osition, ty ent and
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1 CO2	✓ ✓	<b>v</b>	<b>√</b>	✓ ✓	v	✓ ✓		•	•	v	✓	▼ √
CO3	√	✓		∕	✓		~		<b>√</b>			✓
VII		DISTRI		D COM	PUTIN	G		After str be able	to: Explain concep comput demons distribu commu synchro Apply of techniq implem tolerant practical algorith Critical distribu by anal bottlen strategi mechar	the func- ts of dist strating control onication distribute ues to de- tent scala t systems al skills i mms and ly assess ated com yzing pe ecks, loa es, and f hisms to	ems by comprehe	ension of s, and isms. iting fault- asing uted sistency. imize olutions ce ing very efficient

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	7	PO8	PO9	PO10	PO11	PO12
CO1	,	∕ √		√	√	~			$\checkmark$	√	✓		✓
CO2	,		√	√		√						✓	✓
CO3 VI		✓ ✓ CYBEF		$\checkmark$	$\checkmark$		<u> </u>	✓	$\checkmark$	✓		se, stude	$\checkmark$
								b		Underst principl privacy framew ethical of Apply k and data analyze challeng environ Critical strategio privacy cyber la	es of cyl by expla orks, reg considera mowledg a privacy and add ges in dia ments. ly assess es for saf and com	ge of cyb v regulati ress lega	and data gal and er laws ons to l pmmend ag data <i>v</i> ith global
CO1	PO1		PO3	PO4 ✓	PO5 ✓	PO7	1	PO8	PO9 ✓	PO10 ✓	PO11	PO12 ✓	
CO2	,		✓	$\checkmark$		$\checkmark$						✓	$\checkmark$
CO3 VI	[	RDBM: MONG	ODB		_				IBI	M Skill	s Acader	-	-
VI		MAJOF	R PROJ	ECT PI	HASE-1				<ul> <li>aculty,</li> <li>Ur</li> <li>ob</li> <li>be</li> <li>go</li> <li>an</li> <li>Pli</li> <li>by</li> <li>prediction</li> <li>prediction</li> <li>e</li> <li>E</li> <li>prediction</li> <li>e</li> <li>E</li> <li>prediction</li> <li>av</li> <li>ch</li> <li>Th</li> </ul>	is required inderstant jectives able to als, req ticipate an and of outlinit oject project sc ethodol- liverable neline valuate oposed nsiderin ailable allenge ney will	ired to: ad the score s of the n summar uirement d outcom design th ng a com oposal th ope, obje ogies, ex les, and a the feasi major pr ng factor resource s, and ex justify th	najor pro- rize the p ts, and nes. he major p nprehension nat incluce ectives, pected n prelimin bility of	ject, and roject's project ive les nary their their

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PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	<ul> <li>✓</li> </ul>		✓	$\checkmark$	$\checkmark$		√	√	✓		✓
CO2	✓	√	$\checkmark$		$\checkmark$					✓	✓
CO3	<ul> <li>✓</li> </ul>		~	$\checkmark$		√	<ul> <li>✓</li> </ul>	√			✓
							<ul> <li>po of du se:</li> <li>Ap the pro- eff an fie</li> <li>Cr to the int rec im</li> </ul>	emember licies, p the org ring the ssions. oply the eir cour ojects w fectively d techn eld of st itically the org e challe ternship commen	anization e orientat sework t vithin the y implen iques rel udy. assess th	es, and g n as prese ion and t dge gaine o real-we o organiz nenting the evant to neir contri- t's goals, ed during pose for proce	uidelines ented training ed from orld ation, he skills their fibutions evaluate g their
PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓ ✓		✓	$\checkmark$	√		√	√	$\checkmark$		✓
	✓ ✓	√	✓		√					✓	<ul> <li>✓</li> </ul>
			✓	✓		✓		<b>√</b>			✓ 
CO2       ✓       ✓       ✓         VII       PATENT FILING & IPR       After studying this course, student be able to:         VII       PATENT FILING & IPR       After studying this course, student be able to:         •       Understand the basic concept intellectual property rights () and patent filing, and be able recall key terminology, legal frameworks, and the importation protecting intellectual propet.         •       Apply their knowledge of IP analyze real-world scenarios identifying potential intellect property assets, and determin suitable strategies for patent trademark registration, or co protection.         •       Evaluate the benefits and challenges of different IPR strategies within specific ind or business contexts. They we demonstrate the ability to create the create the ability to create the cre											

							wi	th busir		n plan th s and en			
PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
C01	$\sqrt{102}$	105	10+	<u>105</u> ✓	100 ✓	107	100	<u>10</u> ,∕	1010 ✓	1011	<u>1012</u> ✓		
CO2	✓	√	~		✓					✓	$\checkmark$		
CO3	<ul> <li>✓</li> </ul>		✓	√		√	✓	✓			$\checkmark$		
<ul> <li>Understand the chosen technical topic and be able to summarize its key concepts, principles, and relevance within the context of the seminar.</li> <li>Analyze the topic by gathering an synthesizing relevant information from various sources. They will then present their findings in a coherent and engaging manner, highlighting the main points, challenges, and potential applications of the subject.</li> <li>Evaluate the strengths and limitations of the chosen technical topic. They will identify potential areas for further research, discuss potential implications, and engage in thoughtful discussions about th topic's broader impact.</li> </ul>													
PO	l PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CO1	✓ ✓		✓	✓	✓	-	✓	✓	✓		$\checkmark$		
CO2	✓	$\checkmark$	✓		✓					✓	$\checkmark$		
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		improvements or innovative solutions.													
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CO3	<u>۷</u>	∕ ✓ PROJE		$\checkmark$	$\checkmark$		∕	✓	$\checkmark$			$\checkmark$			
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
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