RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY

5thKM Stone Delhi, Meerut Road, Near Raj Nagar Extension Road, Ghaziabad, UP-201003
Approved by AICTE, N. Delhi &Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow
NBA Accredited Program (B. Tech- ECE, IT) & B. Pharma

Authentication Latter

2.6.1 Programme Outcomes (POS) and Course Outcomes (COS) for all Programmes offered by the institution are stated and displayed on website.

The following documents are submitted for authenticating POs and COs

- COS, POS & PSO on Institute Website Page
- Programme Outcomes displayed at various locations in campus
- Documents related to OBE implementation
    1. CO, PO and PSO Mapping
    2. Course outcomes for a sample courses
    3. Sample Question Paper - Mapping and Outcome Analysis

Director

Director
Raj Kumar Goel Institute of Technology
5th KM Stone, Delhi-Meerut Road,
Ghaziabad

2.6.1. Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institute are stated and displayed on website

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POs & PSO in Institute Website Page www.rkgit.edu.in

POs on college website IT Department Page

PEOs on college website IT Department Page

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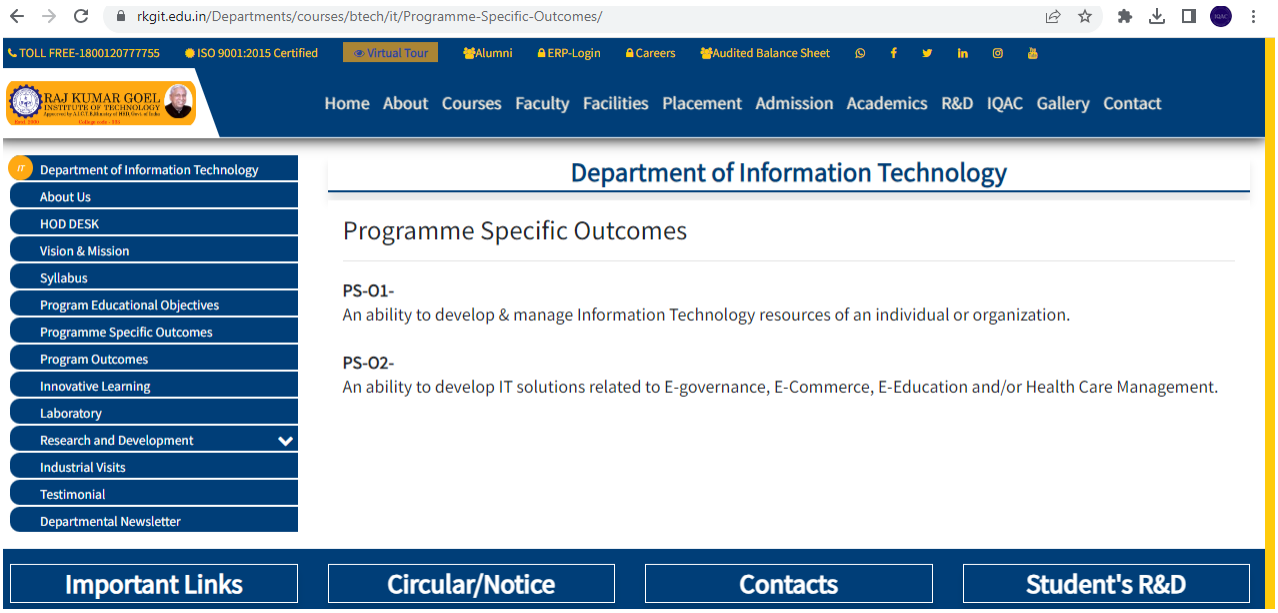

PEOs on college website IT Department Page

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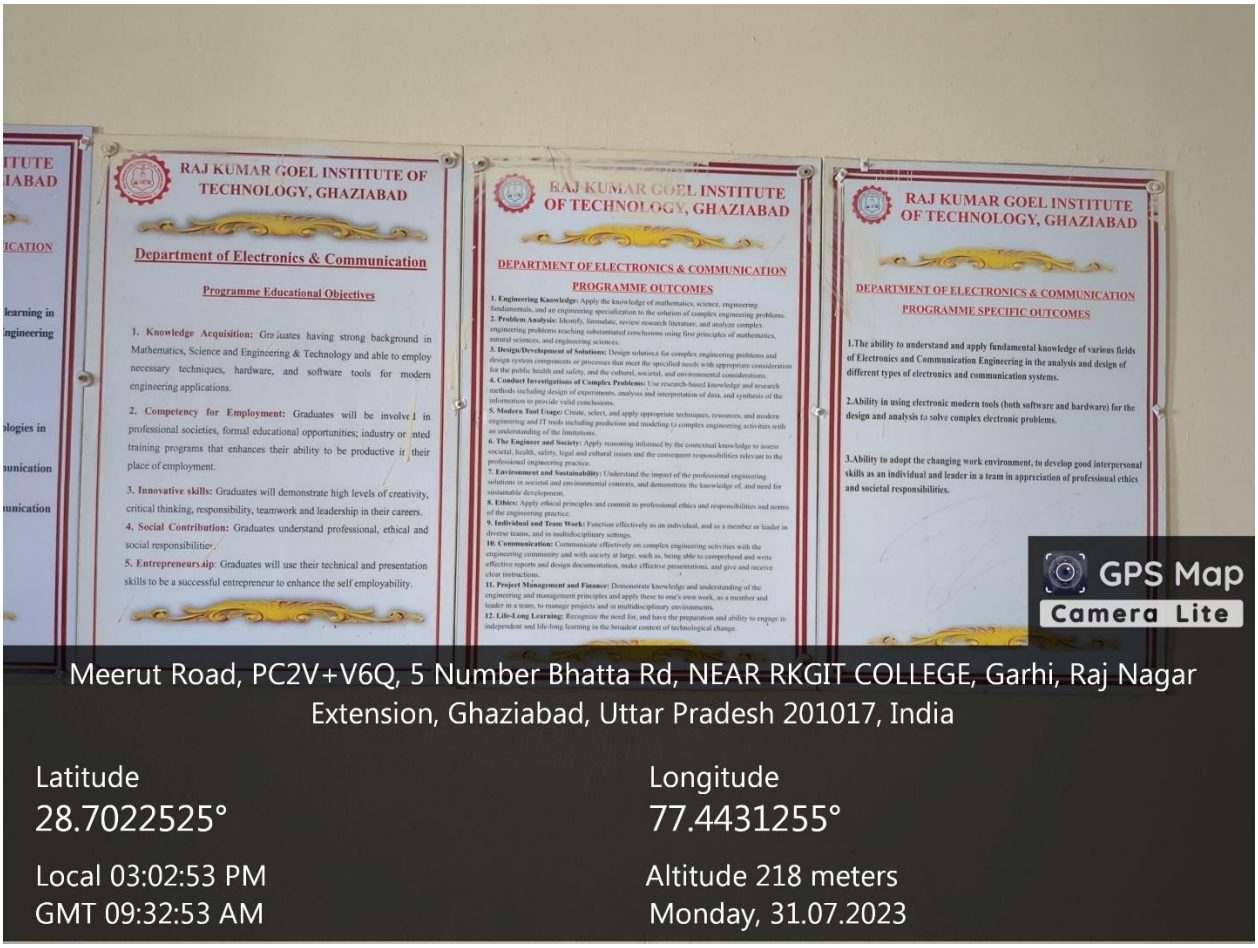
Programme Outcomes displayed at various locations in campus



ECE Department Classroom

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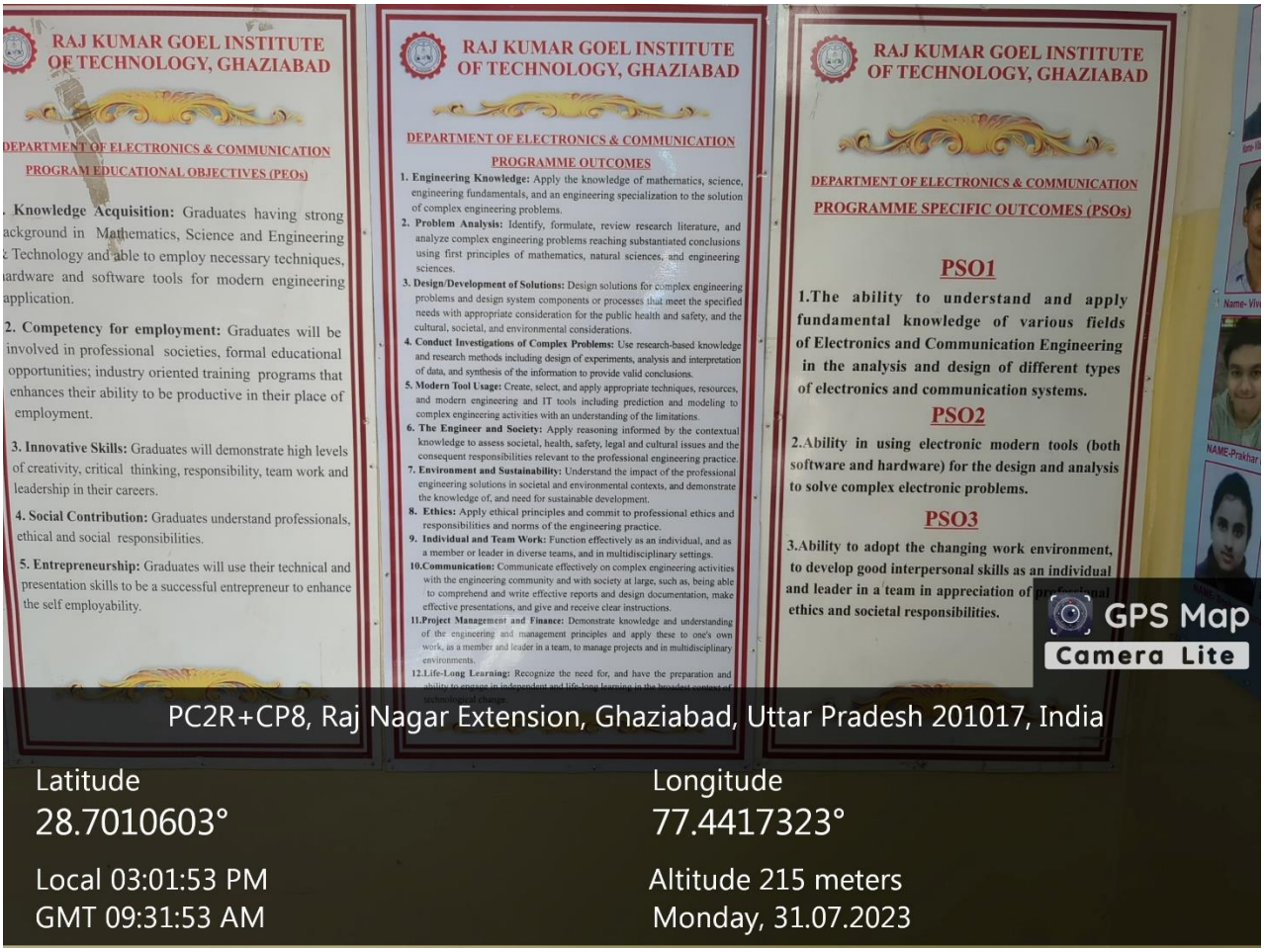

ECE Department

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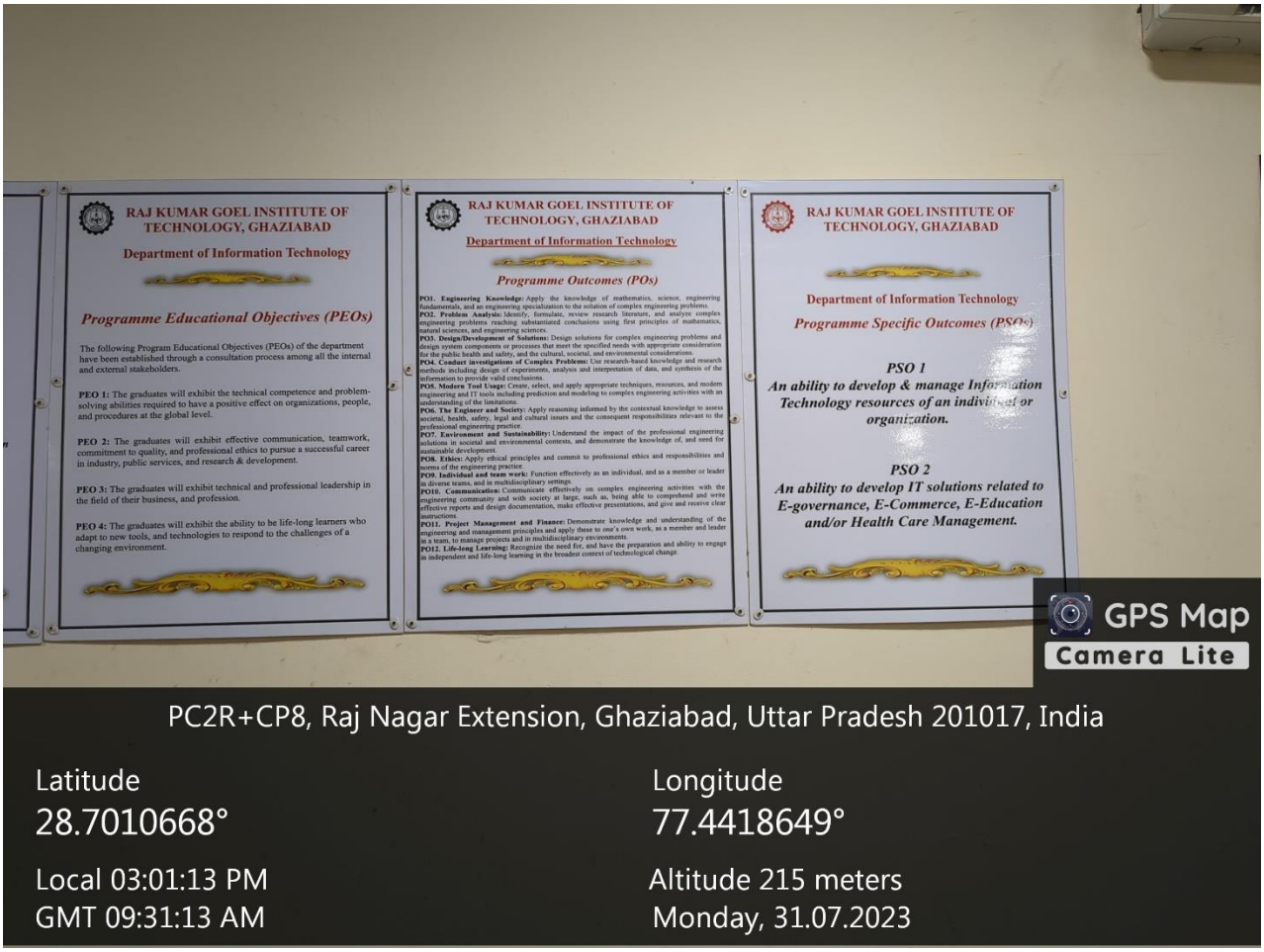

IT Department Classroom

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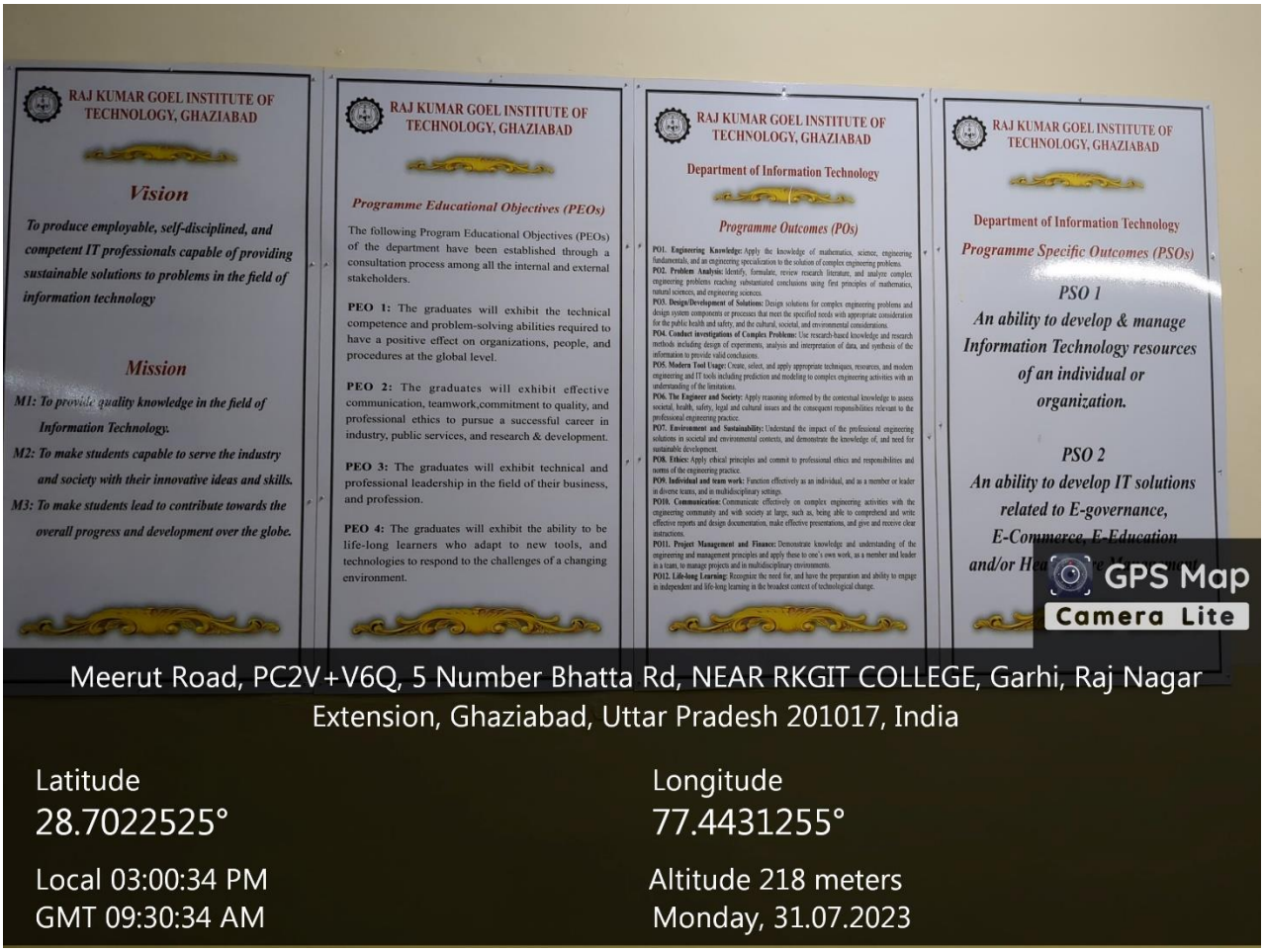
NBA Accredited Program (B. Tech- ECE, IT) & B. Pharma



IT Department

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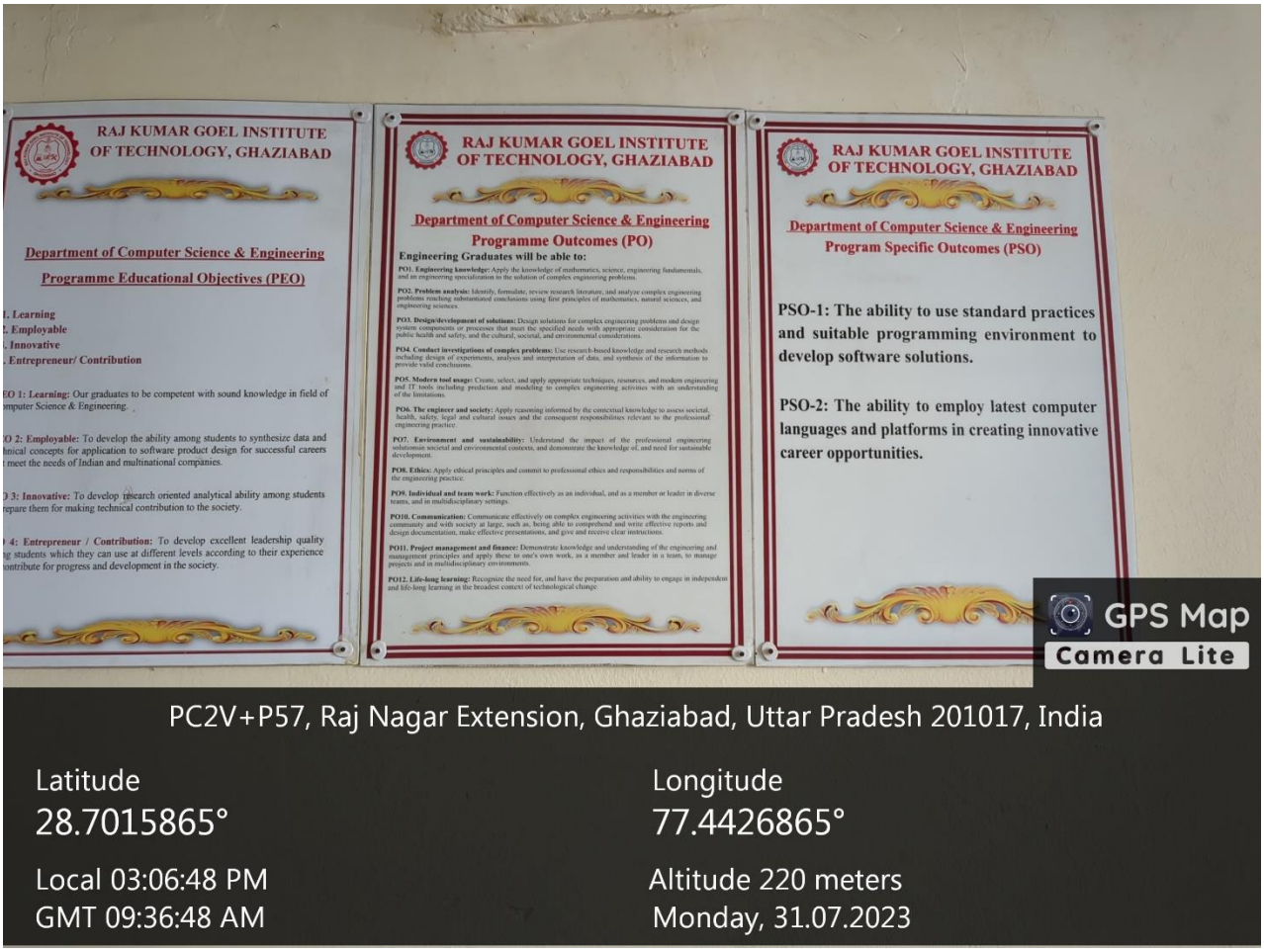

CSE Department Classroom

Raj Kumar Goel Institute of Technology
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Department of ECE

2022-23

5th KM Stone, Delhi – Meerut Road, Ghaziabad (U.P. – 201003)
Toll Free: 1800120777755, Contact us: 0120-2788273, Website: www.rkgit.edu.in

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Course Outcomes (CO) mapping with Programme Outcomes (PO) and Programme Specific Outcomes (PSO)

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Institute Vision and Mission

Vision of the Institute

To continually develop excellent professional capable of providing sustainable solutions to challenging problems in their fields and prove responsible global citizens.

Mission of the Institute

We wish to serve the nation by becoming reputed deemed university for providing value based professional education.

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Department Vision and Mission

Vision of the Department

To develop the Department into a full-fledged Center of learning in various fields of Electronics & Communication Engineering keeping in view the latest developments in the world.

Mission of the Department

M1: To educate the students in Contemporary Technologies in Electronics and Communication Engineering.

M2: To educate the students in Electronics and Communication Engineering to meet the Industrial needs.

M3: To educate the students in Electronics and Communication Engineering to meet the Societal needs.

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Program Outcomes

PO1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Program Educational Objectives

PEO1-Knowledge Acquisition: _ Graduates having strong background in Mathematics, Science and Engineering & Technology and able to employ necessary techniques, hardware and software tools for modern engineering application

PEO2-Competency for Employment: Graduates will be involved in professional societies, formal educational opportunities; industry oriented training programs that enhanced their ability to be productive in their place of employment.

PEO3-Innovative skills: Graduates will demonstrate high level of creativity, critical thinking, responsibility, team work and leadership in their careers.

PEO4-Social Contribution: Graduates understand professionals, ethical and social responsibilities

PEO5-Entrepreneurship: Graduates will use their technical and presentation skills to be successful entrepreneur to enhance the self employability.

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Program Specific Outcomes (PSO)

PSO 1 :The ability to understand and apply fundamental knowledge of various fields of electronics and communication engineering in the analysis and design of different types of electronics and communication systems.

PSO 2 : Ability in using electronic modern tools (Both software and hardware) for the design and analysis to solve complex electronic problems.

PSO 3: Ability to adopt the changing environment, to develop good interpersonal skills as an individual and leader in a team in appreciation of professional ethics and societal responsibilities.

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Evaluation Scheme

B.Tech. (Electronics & Communication Engg.) **Semester III**

Sr. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
	KOE031-38/ KAS302	Engg. Science Course /Maths IV	3	1	0	30	20	50		100		150	4
1.	KAS301/ KVE301	Technical Communication /Universal Human values	2 3	1 0	0 0	30	20	50		100		150	3
2.	KEC301	Electronic Devices	3	1	0	30	20	50		100		150	4
3.	KEC302	Digital System Design	3	1	0	30	20	50		100		150	4
4.	KEC303	Network Analysis and Synthesis	3	0	0	30	20	50		100		150	3
6.	KEC351	Electronics Devices Lab	0	0	2				25		25	50	1
7.	KEC352	Digital System Design Lab	0	0	2				25		25	50	1
8.	KEC353	Network Analysis and Synthesis lab	0	0	2				25		25	50	1
9.	KEC354	Mini Project or Internship Assessment	0	0	2			50				50	1
10.	KNC301 /KNC302	Computer System Security /Python Programming	2	0	0	15	10	25		50			0
11.		MOOCs (Essential for Hons. Degree)											
		TOTAL										**950**	**22**
*The Mini Project or internship (3-4 weeks) conducted during summer break after II semester and will be assessed during III semester.													

Semester IV

Sr. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1.	KAS402/ KOE041-48	Maths-IV / Engg. Science Course	3	1	0	30	20	50		100		150	4
2.	KVE401/ KAS401	Universal Human Values/ Technical Communication	3 2	0 1	0 0	30	20	50		100		150	3
3.	KEC401	Communication Engineering	3	0	0	30	20	50		100		150	3
4.	KEC402	Analog Circuits	3	1	0	30	20	50		100		150	4
5.	KEC403	Signal System	3	1	0	30	20	50		100		150	4
6.	KEC451	Communication Engineering Lab	0	0	2				25		25	50	1
7.	KEC452	Analog Circuits Lab	0	0	2				25		25	50	1
8.	KEC453	Signal System Lab	0	0	2				25		25	50	1
9.	KNC402/ KNC401	Python Programming/ Computer System Security	2	0	0	15	10	25		50			0
10.		MOOCs (Essential for Hons. Degree)											
		TOTAL										**900**	**21**

Raj Kumar Goel Institute of Technology

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Sub Code	**KAS-302**
Sub. Name	**Math IV**

COURSE OUTCOMES		**Bloom's Level**
CO1	Study the methods to solve Partial Differential Equations.	K3
CO2	Apply the concept of separation of variables to solve wave, heat, Laplace and transmission equations.	K3
CO3	Evaluate Moments, M, G.F Correlations, linear regression.	K5
CO4	Apply the concept of probability to solve discrete and continuous probability distributions.	K3
CO5	Apply the concept of sampling to study t-test, F-test and Chi-square test, One-way Analysis of Variance (ANOVA).	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										2
CO2	3	3	2									2
CO3	3	3	2	3	2							2
CO4	3	3	1	1	1							1
CO5	3	3	2	3	3	2	2					2
Average	3	3	1.75	2.3	2	2	2					1.8

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	1	2	
CO2	1	2	
CO3	1	2	
CO4	1	1	
CO5	1	3	
Average	1	2	

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Sub Code	**KVE-301**
Sub. Name	**UNIVERSAL HUMAN VALUES AND PROFESSIONAL ETHICS**

COURSE OUTCOMES		**Bloom's Level**
CO1	To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.	K4
CO2	To help the student to understand that human beings as the coexistence of sentient self (I) and the material body and programs to ensure the health of the self(sanyam) and health of the body(Swasthya) and the correct appraisal of physical needs.	K4
CO3	To help the student to understand the basic requirement of values in human- human relationship in the family as well as in the society that leads to harmony in family as well as in the society.	K4
CO4	To help the student to understand the interconnectedness and mutual fulfilment of the 4 orders of existence that enable one to live in harmony with nature.	K4
CO5	To help the student to understand the definitiveness of ethical human conduct and help them to develop strategy for developing holistic technologies, management models, and production systems.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3	3	3	3	3	3	3
CO2						3	3	3	3	3	3	3
CO3						3	3	3	3	3	3	3
CO4						3	3	3	3	3	3	3
CO5						3	3	3	3	3	3	3
Average						**3**	**3**	**3**	**3**	**3**	**3**	**3**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	-	-		-
CO2	-	-		-
CO3	-	-		-
CO4	-	-		-
CO5	-	-		-
Average	-	-		-

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Sub Code	**KEC-301**
Sub. Name	**Electronic Devices**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the concepts of semiconductor physics to formulate Energy band gap.	K2
CO2	Understand carrier transport in semiconductors and design resistors.	K3
CO3	Understand and utilize the mathematical models of semiconductor junctions.	K2
CO4	Utilize the mathematical models of MOS transistors for circuits and systems.	K3
CO5	Analyse and find application of special purpose diodes.	K2

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3										
CO2	3	3										2
CO3	3	3										3
CO4	3	3										3
CO5	3	3										3
Average	**3**	**3**										**2.7**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3			
CO2	3			
CO3	3			
CO4	3			
CO5	3			
Average	**3**			

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Sub Code	**KEC-302**
Sub. Name	**Digital System Design**

COURSE OUTCOMES		**Bloom's Level**
CO1	Design and analyze combinational logic circuits.	K4/ K6
CO2	Design and analyze modular combinational logic circuits with MUX / DEMUX, decoder & encoder.	K4/ K6
CO3	Design and analyze sequential logic circuits.	K4/ K6
CO4	Analyze various logic families.	K4
CO5	Design ADC & DAC and implement in amplifier, integrator, etc.	K4,6

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	2	2				2	2		
CO2	3	2	2	2	2				2	3		
CO3	3	2	3	2	2				2	3		
CO4	2	2	3	3	3				2	3		
CO5	3	2	3	3	3				2	3		
Average	**2.8**	**2**	**2.6**	**2.4**	**2.4**				**2**	**2.8**		

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	2		
CO2	2	2		
CO3	2	2		
CO4	3	2		
CO5	3	2		
Average	**2.4**	**2**		

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Sub Code	**KEC-303**
Sub. Name	**Network Analysis and Synthesis**

COURSE OUTCOMES		**Bloom's Level**
CO1	Student will be able to understand basics electrical circuits with nodal and mesh analysis.	K2
CO2	Student will be able to apply network theorems on electrical circuit.	K3
CO3	Student will be able to analyse electrical circuits using Fourier series and transform.	K4
CO4	Student will be able to analyse steady state and transient state using Laplace Transform.	K4
CO5	Student will be able to analyse various parameter for two port network and filter.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	3	-	-	-	-	-	-	-
CO2	2	2	3	3	2	-	-	-	-	-	-	-
CO3	2	3	3	3	3	-	-	-	-	-	-	-
CO4	3	3	3	2	2	-	-	-	-	-	-	-
CO5	3	2	2	3	3	-	-	-	-	-	-	-
Average	2.6	2.6	2.6	2.6	2.6	-	-	-	-	-	-	-

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	-	-	
CO2	2	-	-	
CO3	2	-	-	
CO4	2	2	-	
CO5	2	2	-	
Average	2	2	-	

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Sub Code	**KEC-351**
Sub. Name	**Electronic Devices Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand working of basic electronics lab equipment.	K2
CO2	Understand working of PN junction diode and its applications.	K3
CO3	Understand characteristics of Zener diode.	K2
CO4	Design a voltage regulator using Zener diode.	K4
CO5	Understand working of BJT, FET, MOSFET and apply the concept in designing of amplifiers.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2		2	2					2	2		2
CO2	3	2	3	2	2				2	2		2
CO3	2	2	3	2	2				2	2		2
CO4	3	2	3	2	2				2	2		2
CO5	3	2	2	3	2				2	2		2
Average	**2.6**	**2**	**2.6**	**2.2**	**2**				**2**	**2**		**2**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	2		
CO2	3	2		
CO3	3	2		
CO4	3	2		
CO5	3	2		
Average	**3**	**2**		

Raj Kumar Goel Institute of Technology

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Sub Code	**KEC 352**
Sub. Name	**Digital System Design Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Design and analyze combinational logic circuits.	K6, K4
CO2	Design & analyze modular combinational circuits with MUX/DEMUX, decoder, encoder.	K6, K4
CO3	Design & analyze synchronous sequential logic circuits.	K6,K4
CO4	Design & build mini projects using digital ICs.	K6. K4

Low-1 Medium-2 High-3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	2				2	2		
CO2	3	3	3	3	2				3	2		
CO3	3	3	3	3	2				2	2		
CO4	3	3	3	3	2				3	3		
Average	**2.75**	**2.75**	**2.75**	**2.75**	**2**				**2.5**	**2.25**		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	3	2	-
CO2	3	2	-
CO3	3	2	-
CO4	3	2	-
Average	**3**	**2**	**-**

Raj Kumar Goel Institute of Technology

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Sub Code	**KEC-353**
Sub. Name	**Network Analysis and Synthesis Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand basics of electrical circuits with nodal and mesh analysis.	K2
CO2	Analyze electrical network theorems.	K4
CO3	Analyze RLC circuits.	K4
CO4	Analyze the stability of an electrical circuit.	K4
CO5	Apply the network analysis to design network filters	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	2	3	-	-	-	3	3	-	-
CO2	3	2	-	2	3	-	-	-	3	3	-	-
CO3	3	2	-	2	3	-	-	-	3	3	-	-
CO4	3	2	-	2	3	-	-	-	3	3	-	-
CO5	3	2	-	2	3	-	-	-	3	3	-	-
Average	3	2	-	2	3	-	-	-	3	3	-	-

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	-	2	-	
CO2	-	2	-	
CO3	2	2	-	
CO4	2	2	-	
CO5	2	2	-	
Average	2	2	-	

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Sub Code	**KEC-354**
Sub. Name	**Mini Project Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply techniques/principles in their project.	K-2
CO2	Evaluate team work and time planning in the project.	K-4
CO3	Develop effective communication skills by delivering presentations on project.	K-5
CO4	Analyze the problem identification, formulation and solution in the engineering domain.	K-2
CO5	Discuss components used, simulation, and interpretation of results and validity of project.	K-2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	3					3
CO2								3	3	3	3	3
CO3					2		3	3	3	3	3	3
CO4	3	3	3	3	3	3	3		3	3	3	3
CO5	3	3	3	3	3	3	3		3	3	3	3
Average	3	3	3	3	2.75	3	3	3	3	3	3	3

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3		
CO2			3	
CO3	3	3	3	
CO4	3	3	3	
CO5	3	3	3	
Average	3	3	3	

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Sub Code	**KNC-302**
Sub. Name	**Python Programming**

COURSE OUTCOMES		**Bloom's Level**
CO1	Describe the numbers, math functions, strings, list, tuples and dictionaries in python	K1
CO2	Acquire the skills to apply different decision-making statements and functions in python	K3
CO3	Interpret object-oriented programming in python.	K5
CO4	Develop skill to understand and summarize different file handling operations.	K6
CO5	Demonstrate the ability to design GUI applications in python and evaluate different database operations.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3		3						3
CO2	3	2	3	3		2						3
CO3	3	2	3	2	2	3						2
CO4	3	2	3	2	1	2						1
CO5	3	2	3		3	3						2
Average	3	2	2.8	2.5	2	2.6						2.2

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	1	2	
CO2	1	2	
CO3	1	2	
CO4	1	2	
CO5	1	2	
Average	1	2	

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KOE-045**
Sub. Name	**Basic Data Structure & Algorithm**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the complexity of algorithms by Describing various data structures and their representations in memory with their common applications.	K1,K2
CO2	Describe the concept of recursion and implement various data structures like stack, queue	K2,K3
CO3	Describe the concept of tree.	K2,K3
CO4	Describe the concept graph using static and dynamic memory allocations.	K2,K3
CO5	Study and Apply various searching and sorting algorithms on different data structures.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2									2
CO2	3	3	2									2
CO3	3	3	2									2
CO4	3	3	2									2
CO5	3	3	3									3
Average	**3**	**3**	**2.2**									**2.2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO233.1	3	3	-	-
CO233.2	3	3	-	-
CO233.3	3	3	-	-
CO233.4	3	3	-	-
CO233.5	3	3	-	-
Average	**3**	**3**	-	-

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Sub Code	**KAS-401**
Sub. Name	**Technical communication**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the nature and objective of Technical Communication relevant for the work place as Engineers.	K2
CO2	Utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K3
CO3	Imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K2
CO4	Create a vast know-how of the application of the learning to promote their technical competence	K3
CO5	Evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1								1		3	1	3
CO2		1		2						3	1	3
CO3									2	3		3
CO4										3	2	3
CO5								1		3	1	3
Average		1		2				1	2	3	1.25	3

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1				
CO2				
CO3				
CO4				
CO5				
Average				

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Sub Code	**KEC-401**
Sub. Name	**Communication Engineering**

COURSE OUTCOMES		**Bloom's Level**
CO1	Analyze and compare different analog modulation schemes for their efficiency and bandwidth.	K5
CO2	Analyze different angle modulation signals.	K5
CO3	Analyze the behavior of a communication system in presence of noise.	K4
CO4	Investigate pulsed modulation system and analyze their system performance.	K6
CO5	Analyze different digital modulation schemes and compute the bit error performance.	K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2				2			
CO2	3	3	3	3	2				2			
CO3	3	3	3	3	2				2			
CO4	3	3	3	3	2				2			
CO5	3	3	3	3	2				2			
Average	**3**	**3**	**2**	**2**	**2**				**2**			

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	**3**	**2**	
CO2	**3**	**2**	
CO3	**3**	**2**	
CO4	**3**	**2**	
CO5	**3**	**2**	
Average	**3**	**2**	

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Sub Code	**KEC-402**
Sub. Name	**Analog Circuits**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the characteristics of diodes and transistors	K2
CO2	Design and analyze various rectifier and amplifier circuits	K4
CO3	Design sinusoidal and non-sinusoidal oscillators	K4
CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits	K2
CO5	Design LPF, HPF, BPF, BSF	K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	2	2	2							3
CO2	3	3	3	3	3							3
CO3	3	3	3	3	3							3
CO4	3	3	3	3	3							3
CO5	3	3	3	3	3							3
Average	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**							**3**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	2	2	-
CO2	2	2	2	-
CO3	2	2	2	-
CO4	2	2	2	-
CO5	2	2	2	-
Average	**2**	**2**	**2**	**-**

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Sub Code	**KEC-403**
Sub. Name	**Signal System**

COURSE OUTCOMES		**Bloom's Level**
CO1	Analyze different types of signals.	K4
CO2	Analyze linear shift-invariant (LSI) systems.	K4
CO3	Represent continuous and discrete systems in time and frequency domain using Fourier series and transform.	K3
CO4	Analyze discrete time signals in z-domain.	K4
CO5	Study sampling and reconstruction of a signal.	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2			2				
CO2	3	3	3	2	2			2				
CO3	3	3	3	2	2			2				
CO4	3	3	3	2	2			2				
CO5	3	3	3	2	2			2				
Average	3	3	3	2	2			2				

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	3	2	
CO5	3	2	
Average	3	2	

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Sub Code	**KEC-451**
Sub. Name	**Communication Engineering Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Analyze and compare different analog modulation schemes for their modulation factor and power.	K-4
CO2	Study pulse amplitude modulation.	K-2
CO3	Analyze different digital modulation schemes and can compute the bit error performance.	K-4
CO4	Study and simulate the Phase shift keying.	K-2
CO5	Design a front end BPSK modulator and demodulator.	K-6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3				3	3		
CO2	3	3	3	3	3				3	3		
CO3	3	3	3	3	3				3	3		
CO4	3	3	3	3	3				3	3		
CO5	3	3	3	3	3				3	3		
Average	3	3	3	3	3				3	3		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3	3	
CO2	3	3	3	
CO3	3	3	3	
CO4	3	3	3	
CO5	3	3	3	
Average	3	3	3	

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Sub Code	**KEC-452**
Sub. Name	**Analog Circuit Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the characteristics of diodes and transistors.	K2
CO2	Design and analyze various rectifier and amplifier circuits.	K4,K6
CO3	Design sinusoidal and non-sinusoidal oscillators.	K6
CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K2
CO5	Design ADC and DAC.	K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3				3	3		
CO2	3	2	2	2	3				3	3		
CO3	3	2	2	2	3				3	3		
CO4	3	2	2	2	3				3	3		
CO5	3	2	2	2	3				3	3		
Average	3	2	2	2	3				3	3		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	3	3	
CO2	3	3	
CO3	3	3	
CO4	3	3	
CO5	3	3	
Average	3	3	

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Sub Code	**KEC 453**
Sub. Name	**Signals and systems Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the basic operations of MATLAB.	K2
CO2	Analysis the time domain and frequency domain signals.	K4
CO3	Implement the concept of fourier series and fourier transforms.	K4
CO4	Find the stability of system using pole -zero diagram and bode diagram.	K4
CO5	Design frequency response of the system.	K5

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	2				2	2		3
CO2	3	3	3	3	3				2	2		3
CO3	3	3	3	3	3				2	2		3
CO4	3	3	3	3	3				2	2		3
CO5	3	3	3	3	3				2	2		3
Average	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**				**2**	**2**		**3**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	-
CO2	3	3	2	-
CO3	3	3	2	-
CO4	3	3	2	-
CO5	3	3	2	-
Average	**2.8**	**3**	**2**	**-**

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Sub Code	**KNC-401**
Sub. Name	**Computer system security**

COURSE OUTCOMES		**Bloom's Level**
CO1	Software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats .	K1,K2
CO2	Cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats.	K2
CO3	Explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K3
CO4	Articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios.	K4
CO5	Articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K5,K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO233.1	2	2		2		2			2			2
CO233.2	2	2		2		2			2			2
CO233.3	2	2		2		2			2			2
CO233.4	2	2		3		2			2			2
CO233.5	3	2		3		2			2			2
Average	**2.2**	**2**		**2.4**		**2**			**2**			**2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO233.1	2			
CO233.2	2			
CO233.3	2			
CO233.4	2			
CO233.5	3			
Average	**2.2**			

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B.Tech. 3rd Year V Semester ECE Scheme

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KEC-501	Integrated Circuits	3	1	0	30	20	50		100		150	4
2	KEC-502	Microprocessor & Microcontroller	3	1	0	30	20	50		100		150	4
3	KEC-503	EMFT & Wave Propagation	3	1	0	30	20	50		100		150	4
4	KEC-051 – 054	Department Elective -I	3	0	0	30	20	50		100		150	3
5	KEC-055 - 058	Department Elective -II	3	0	0	30	20	50		100		150	3
6	KEC-551	Integrated Circuits Lab	0	0	2				25		25	50	1
7	KEC-552	Microprocessor & Microcontroller Lab	0	0	2				25		25	50	1
8	KEC 553A-553D	Lab for Department Elective-II*	0	0	2				25		25	50	1
9	KEC-554	Mini Project or Internship Assessment**	0	0	2				50			50	1
10	KNC 501/ KNC 502	Constitution of India / Essence of Indian Traditional Knowledge	2	0	0	15	10	25		50			NC
11		MOOCs (Essential for Hons. Degree)											
		Total										**950**	**22**

**The Mini Project or internship (4 weeks) conducted during summer break after IV semester and will be assessed during V semester.

Department Elective-I

KEC-051 Electronic Switching
KEC-052 Industrial Electronics
KEC-053 VLSI Technology KEC-
054 Real Time Systems

Department Elective-II

KEC-055 Digital Signal Processing
KEC-056 Advance Semiconductor Devices
KEC-057 Electronic Instrumentation & Measurements
KEC-058 Optical Communication

***Lab for Department Elective -II**

KEC-553A Digital Signal Processing Lab
KEC-553B Advance Semiconductor Devices Lab
KEC-553C Electronic Instrumentation & Measurements Lab
KEC-553D Optical Communication Lab

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B.Tech. 3rd Year VI Semester ECE Syllabus

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KEC-601	Digital Communication	3	1	0	30	20	50		100		150	4
2	KEC-602	Control System	3	1	0	30	20	50		100		150	4
3	KEC-603	Antenna and Wave Propagation	3	1	0	30	20	50		100		150	4
4	KEC-061 – 064	Department Elective –III	3	0	0	30	20	50		100		150	3
5		Open Elective-I	3	0	0	30	20	50		100		150	3
6	KEC-651	Digital Communication Lab	0	0	2				25		25	50	1
7	KIC-652	Control System Lab	0	0	2				25		25	50	1
8	KEC-653	Elective Lab	0	0	2				25		25	50	1
9	KNC 601/ KNC 602	Constitution of India, Law and Engineering/ Indian Tradition, Culture and Society.	2	0	0	15	10	25		50			NC
10		MOOCs (Essential for Hons. Degree)											
		Total										**900**	**21**

Department Elective-III

KEC-061	Microcontroller & Embedded System Design
KEC-062	Satellite Communication
KEC-063	Data Communication Networks
KEC-064	Analog Signal Processing
KEC-065	Random Variables & Stochastic Process

Course Code	Elective Lab
KEC-653A	Measurement & Instrument Lab
KEC-653B	Cad for Electronics Lab
KEC-653C	Microcontroller & Embedded System Design

Open Elective-I

1. Artificial Intelligence https://swayam.gov.in/nd2_cec20_cs10/preview
2. Embedded System Design https://swayam.gov.in/nd1_noc20_cs14/preview

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Sub Code	**KEC-501**
Sub. Name	**Integrated Circuits**

COURSE OUTCOMES		**Bloom's Level**
CO1	Explain complete internal analysis of Op-Amp 741-IC.	K2
CO2	Examine and design Op-Amp based circuits and basic components of ICs such as various types of filter.	K6
CO3	Implement the concept of Op-Amp to design Op-Amp based non-linear applications and wave-shaping circuits.	K3
CO4	Analyse and design basic digital IC circuits using CMOS technology.	K6
CO5	Describe the functioning of application specific ICs such as 555 timer ,VCO IC 566 and PLL.	K2

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	2								
CO2	3	3	3	2								
CO3	3	3	3	2								
CO4	3	3	3	2								
CO5	3	3	3	2								
Average	3	3	3	2								

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3		-	-
CO2	3		-	-
CO3	3		-	-
CO4	3		-	-
CO5	3		-	-
Average	3		-	-

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Sub Code	**KEC-502**
Sub. Name	**Microprocessor & Microcontroller**

COURSE OUTCOMES		**Bloom's Level**
CO1	Demonstrate the basic architecture of 8085.	K-2
CO2	Illustrate the programming model of microprocessors & write program using 8085 Microprocessor.	K-2
CO3	Demonstrate the basics of 8086 Microprocessor and interface different external Peripheral Devices like timer, USART etc. with Microprocessor (8085/8086).	K-2
CO4	Compare Microprocessors & Microcontrollers, and comprehend the architecture of 8051 Microcontroller.	K-5
CO5	Illustrate the programming model of 8051 and implement them to design projects on real time Problems.	K-6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2							
CO2	3	2	3	3	3							
CO3	3	2	3	3	3							
CO4	3	2	3	3	3							
CO5	3	2	3	3	3							
Average	3	2	3	2.8	2.8							

O-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2		-
CO2	3	2		-
CO3	3	2		-
CO4	3	2		-
CO5	3	2		-
Average	3	2		-

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Sub Code	**KEC-503**
Sub. Name	**Digital Signal Processing**

COURSE OUTCOMES		**Bloom's Level**
CO1	Design and describe different types of realizations of digital systems (IIR and FIR) and their utilities.	K6
CO2	Select design parameters of analog IIR digital filters (Butterworth and Chebyshev filters) and implement various methods such as impulse invariant transformation and bilinear transformation of conversion of analog to digital filters.	K6
CO3	Design FIR filter using various types of window functions.	K6
CO4	Define the principle of discrete Fourier transform & its various properties and concept of circular and linear convolution. Also, students will be able to define and implement FFT i.e. a fast computation method of DFT.	K3
CO5	Define the concept of decimation and interpolation. Also, they will be able to implement it in various practical applications.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2			2				
CO2	3	3	3	2	2			2				
CO3	3	3	3	2	2			2				
CO4	3	3	3	2	2			2				
CO5	3	3	3	2	2			2				
Average	3	3	3	2	2			2				

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	2		
CO2	3	2		
CO3	3	2		
CO4	3	2		
CO5	3	2		
Average	3	2		

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Sub Code	**KEC-053**
Sub. Name	**VLSI Technology**

COURSE OUTCOMES		**Bloom's Level**
CO1	Student will be able to interpret the basics of crystal growth, wafer preparation and wafer cleaning	K3
CO2	Student will be able to evaluate the process of Epitaxy and oxidation	K4
CO3	Student will be able to differentiate lithiography, etching and deposition process	K5
CO4	Student will be able to analyze the process of diffusion and ion implantation	K4
CO5	Student will be able to express the basic process involved in metallization and packaging	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	1				2			3
CO2	3	3	3	2	1				2			3
CO3	3	3	3	2	1				2			3
CO4	3	3	3	2	1				2			3
CO5	3	3	3	2	2				2			3
Average	3	3	3	2	1.2				2			3

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	3	3	2
CO2	3	3	2
CO3	3	3	2
CO4	3	3	2
CO5	3	3	2
Average	3	3	2

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Sub Code	**KEC-058**
Sub. Name	**Optical Communication**

COURSE OUTCOMES		**Bloom's Level**
CO1	Define and explain the basic concepts and theory of optical communication.	K1
CO2	Describe the signal losses with their computation and dispersion mechanism occurring inside the optical fiber cable.	K2
CO3	Differentiate the optical sources used in optical communication with their comparative study.	K4
CO4	Identify different optical components on receiver side: assemble them to solve real world problems related to optical communication systems.	K4
CO5	Evaluate the performance of an optical receiver to get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain.	K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2							
CO2	2	2	2	2	2							
CO3	2	2	2	2	2							
CO4	2	2	2	2	2							
CO5	2	2	2	2	2							
Average	2.2	2.2	2	2	2							

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	2		
CO2	2	2		
CO3	2	2		
CO4	2	2		
CO5	2	2		
Average	2	2		

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-551**
Sub. Name	**Integrated Circuits Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Design different non-linear applications of operational amplifiers such as log, antilog amplifiers and voltage comparators.	K6
CO2	Explain and design different linear applications of operational amplifiers such as filters.	K6
CO3	Demonstrate the function of waveforms generator using op-Amp.	K3
CO4	Construct multivibrator and oscillator circuits using IC555 and IC-566 and perform measurements of frequency and time.	K6
CO5	Design and practically demonstrate the applications based on IC-555 and IC-566	K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2				3	3		
CO2	3	3	3	2	2				3	3		
CO3	3	3	3	2	2				3	3		
CO4	3	3	3	2	2				3	3		
CO5	3	3	3	2	2				3	3		
Average	3	3	3	2	2				3	3		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	-
CO2	3	3	-	-
CO3	3	3	-	-
CO4	3	3	-	-
CO5	3	3	-	-
Average	3	3	-	-

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-552**
Sub. Name	**Microprocessor & Microcontroller Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Use techniques, skills, modern engineering tools, instrumentation and software/hardware appropriately to learn and demonstrate arithmetic and logical operations on 8 bit data using microprocessor 8085.	K3
CO2	Analyze 8085 microprocessor and its interfacing with peripheral devices.	K4
CO3	Learn about various conversion techniques using 8085 and generate waveforms using 8085.	K1
CO4	Learn programming concept of 8051 Microcontroller.	K1
CO5	Learn to Interface peripheral devices with Microcontroller so as to design Microcontroller based projects.	K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2							2	2
CO2	3	3	2	2							2	2
CO3	3	3	2	2							2	2
CO4	3	3	2	2							2	2
CO5	3	3	2	2							2	3
Average	**3**	**3**	**2**	**2**							**2**	**2.2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	3	2	
CO2	3	2	
CO3	3	2	
CO4	2	3	
CO5	2	2	
Average	**2.6**	**2.2**	

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-553**
Sub. Name	**Digital Signal Processing Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Create and visualize various discrete/digital signals using MATLAB/Scilab.	K6
CO2	Implement and test the basic operations of Signal processing.	K4/3
CO3	Examine and analyse the spectral parameters of window functions.	K5
CO4	Design IIR and FIR filters for band pass, band stop, low pass and high pass filters.	K6
CO5	Design the signal processing algorithms using MATLAB/Scilab.	K6

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	3	3				2	2		
CO2	3	3	3	3	3				2	2		
CO3	3	3	3	3	3				2	2		
CO4	3	3	3	3	3				2	2		
CO5	3	3	3	3	3				2	2		
Average	**3**	**3**	**3**	**3**	**3**				**2**	**2**		

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO233.1	3	3	-	-
CO233.2	3	3	-	-
CO233.3	3	3	-	-
CO233.4	3	3	-	-
CO233.5	3	3	-	-
Average	**3**	**3**	**-**	**-**

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-554**
Sub. Name	**Mini Project Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply techniques/principles in their project.	K-2
CO2	Evaluate team work and time planning in the project.	K-4
CO3	Develop effective communication skills by delivering presentations on project.	K-5
CO4	Analyze the problem identification, formulation and solution in the engineering domain.	K-2
CO5	Discuss components used, simulation, and interpretation of results and validity of project.	K-2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	3					3
CO2								3	3	3	3	3
CO3					2		3	3	3	3	3	3
CO4	3	3	3	3	3	3	3		3	3	3	3
CO5	3	3	3	3	3	3	3		3	3	3	3
Average	3	3	3	3	2.75	3	3	3	3	3	3	3

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3		
CO2			3	
CO3	3	3	3	
CO4	3	3	3	
CO5	3	3	3	
Average	3	3	3	

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KNC-501**
Sub. Name	**Constitution of India, Law & Engineering**

COURSE OUTCOMES		**Bloom's Level**
CO1	Identify and explore the basic features and modalities about Indian constitution.	K_3
CO2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.	K_2
CO3	Differentiate different aspects of Indian Legal System and its related bodies.	K_2
CO4	Discover and apply different laws and regulations related to engineering practices.	K_2/ K_3
CO5	Correlate role of engineers with different organizations and governance models	K_3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1	2			3	1	3	2			1
CO2			2	1		2		2	2	2	1	2
CO3			1			3	1	2	3	1	1	2
CO4			2		3	2		3	1	2	2	2
CO5		1	1	1	2	2	2	1	2	2	3	2
Average		**1**	**1.6**	**1**	**2.5**	**2.4**	**1.3**	**2.2**	**2**	**1.75**	**1.75**	**1.8**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	-	_	2	-
CO2	-	_	2	-
CO3	-	_	2	-
CO4	-	_	2	-
CO5	-	_	2	-
Average	-	-	**2**	-

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-601**
Sub. Name	**Digital Communication**

COURSE OUTCOMES		**Bloom's Level**
CO1	To formulate basic statistics involved in communication theory.	K6
CO2	To demonstrate the concepts involved in digital communication.	K2
CO3	To explain the concepts of digital modulation schemes.	K5
CO4	To analyze the performance of digital communication systems.	K4
CO5	To apply the concept of information theory in digital systems.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2							2
CO2	3	3	3	3	2							2
CO3	3	3	3	3	2							2
CO4	3	3	3	3	2							2
CO5	3	3	3	3	2							2
Average	3	3	3	3	2							2

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3	2	
CO2	3	3	2	
CO3	3	3	2	
CO4	3	3	2	
CO5	3	3	2	
Average	3	3	2	

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-602**
Sub. Name	**Control System**

COURSE OUTCOMES		**Bloom's Level**
CO1	Describe the basics of control systems along with different types of feedback and its effect. Additionally they will also be able to explain the techniques such as block diagrams reduction, signal flow graph and modeling of various physical systems along with modeling of DC servomotor.	K2
CO2	Explain the concept of state variables for the representation of LTI system.	K2
CO3	Interpret the time domain response analysis for various types of inputs along with the time domain specifications.	K2
CO4	Distinguish the concepts of absolute and relative stability for continuous data systems along with different methods.	K3
CO5	Interpret the concept of frequency domain response analysis and their specifications.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	3	3							
CO2	2	3	3	3	3							
CO3	2	3	3	3	3							
CO4	2	3	3	3	3							
CO5	2	3	3	3	3							
Average	2	3	3	3	3							

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	2		
CO2	3	2		
CO3	3	2		
CO4	3	2		
CO5	3	2		
Average	3	2		

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KOE-062**
Sub. Name	**Embedded System**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the basics of embedded system and its structural units.	K2
CO2	Analyze the embedded system specification and develop software programs.	K4
CO3	Evaluate the requirements of the programming embedded systems, related software architecture.	K3
CO4	Understand the RTOS based embedded system design.	K2
CO5	Understand all the applications of the embedded system and designing issues.	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2								3
CO2	3	3	2	2	1						2	3
CO3	3	3	2	2	1	1		1	1		2	3
CO4	3	3	2	2	2	1					2	3
CO5	3	3	2	3	2	1	1	2	2	1	2	3
Average	**3**	**3**	**2**	**2.2**	**1.5**	**1**	**1**	**1.5**	**1.5**	**1**	**2**	**3**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO233.1	2	1	1	
CO233.2	2	2	2	
CO233.3	2	1	2	
CO233.4	2	1	1	
CO233.5	2	1	2	
Average	**2**	**1.2**	**1.6**	**-**

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-603**
Sub. Name	**Antenna and Wave Propagation**

COURSE OUTCOMES		**Bloom's Level**
CO1	Identify different coordinate systems and their applications in electromagnetic field theory to establish a relation between any two systems using the vector calculus.	K2
CO2	Explain the concept of static electric field, current and properties of conductors.	K2
CO3	Express the basic concepts of ground, space, sky wave propagation mechanism.	K2
CO4	Demonstrate the knowledge of antenna fundamentals and radiation mechanism of the antenna.	K3
CO5	Analyze and design different types of basic antennas.	K6

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	2		2	2					
CO2	3	3	3	2		2	2					
CO3	3	3	3	2		2	2					
CO4	3	3	3	2		2	2					
CO5	3	3	3	2		2	2					
Average	3	3	2	2		2	2					

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3		-	-
CO2	3		-	-
CO3	3		-	-
CO4	3		-	-
CO5	3		-	-
Average	3		-	-

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-062**
Sub. Name	**Satellite communication**

COURSE OUTCOMES		**Bloom's Level**
CO1	Define and list the benefits of satellite communication.	K1
CO2	Demonstrate orbital mechanics principles of satellite communication systems and solve problems related to it	K3
CO3	Describe a satellite link and identify ways to improve the link performance	K2
CO4	Classify new technologies of satellite communication systems as per given specifications	K2
CO5	Examine advanced technologies of satellite launching and describe the Indian satellite system.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2		2	2					
CO2	3	3	3	2		2	2					
CO3	3	3	3	2		2	2					
CO4	3	3	3	2		2	2					
CO5	3	3	3	2		2	2					
Average	3	3	3	2		2	2					

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3		-	-
CO2	3		-	-
CO3	3		-	-
CO4	3		-	-
CO5	3		-	-
Average	3		-	-

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-063**
Sub. Name	**Data Communication Networks**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the basic concepts in design of Data communication networks	K2
CO2	Understand the various aspects of physical layer and data link layer	K2
CO3	Understand the various multiple Access technique and various IEEE standards	K2
CO4	Understand the various protocols, IP addresses utilized in network layer and connecting devices	K2
CO5	Analyze the protocols utilized in transport layer and application layer	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	3	1	2	-	-	-	1	-	1
CO2	1	2	2	3	3	1	-	-	-	-	-	1
CO3	3	2	2	2	1	1	-	-	-	-	-	1
CO4	2	2	3	3	2	1	-	-	-	-	-	1
CO5	2	2	2	3	1	1	-	-	-	-	-	1
Average	2	2	2.4	2.8	1.6	1.2	-	-	-	1	-	1

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	-	-	
CO2	2	-	-	
CO3	2	-	-	
CO4	2	2	-	
CO5	2	-	-	
Average	2.2	2	-	

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-651**
Sub. Name	**Digital Communication Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	To formulate basic concepts of pulse shaping in digital communication	K6
CO2	To demonstrate the concepts of line coding techniques	K3
CO3	To design equipments related to digital modulation schemes	K6
CO4	To analyze the performance of digital communication systems	K4
CO5	To conceptualize error detection & correction using different coding schemes in digital communication	K5

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2				3	3		
CO2	3	3	3	3	2				3	3		
CO3	3	3	3	3	2				3	3		
CO4	3	3	3	3	2				3	3		
CO5	3	3	3	3	2				3	3		
Average	3	3	3	3	2				3	3		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	2		
CO2	3	2		
CO3	3	2		
CO4	3	2		
CO5	3	2		
Average	3	2		

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-652**
Sub. Name	**Control System Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Classify different tools in MATLAB along with the basic matrix operations used in MATLAB.	K3
CO2	Evaluate the poles and zeros on s-plane along with transfer function of a given system.	K4
CO3	Construct state space model of a linear continuous system.	K6
CO4	Evaluate the various specifications of time domain response of a given system.	K4
CO5	Appraise the steady state error of a given transfer function.	K2
CO6	Examine the relative stability of a given transfer function using various methods such as root locus, Bode plot and Nyquist plot.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	3				2	2		
CO2	3	3	2	3	3				2	3		
CO3	3	3	3	3	3				2	3		
CO4	3	3	2	3	3				2	2		
CO5	3	3	3	3	3				2	3		
CO6	3	3	3	3	3				2	3		
Average	**3**	**3**	**2.5**	**3**	**3**				2	2.7		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	2	1	
CO2	2	2	1	
CO3	2	2	1	
CO4	2	2	1	
CO5	2	2	1	
CO6	2	2	1	
Average	**2**	**3**	**1**	

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KEC-653B**
Sub. Name	**CAD OF ELECTRONICS LAB**

COURSE OUTCOMES		**Bloom's Level**
CO1	Design and analyze the performance of different type of inverters.	K6
CO2	Design and analyze the performance of the basic logic gates using CMOS inverter circuit.	K6
CO3	Design and analyze the performance of the memory based digital circuits using CMOS inverter circuit.	K6
CO4	Analyze the performance of the different configuration of MOS amplifier circuits.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3			1	2	2	3	
CO2	3	3	3	3	3			1	2	2	3	
CO3	3	3	3	3	3			1	2	2	3	
CO4	3	3	3	3	3			1	2	2	3	
Average	3	3	3	3	3			1	2	2	3	

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO348.1	3	3		
CO348.2	3	3		
CO348.3	3	3		
CO348.4	3	3		
Average	3	3		

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[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

Sub Code	**KNC-602**
Sub. Name	**INDIAN TRADITIONS, CULTURAL AND SOCIETY**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the Society State and Polity in ancient India	K2
CO2	Distinguish the Indian traditions, languages and literature.	K3
CO3	List the religion& philosophy of ancient, medieval and modern India.	K2
CO4	Discuss the contribution of Science, Management and Knowledge System of different eras in India	K2
CO5	Explain the information about the Cultural Heritage and Performing Arts in India.	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						2		3	2			2
CO2						2		3	2			2
CO3						2		3	2			2
CO4						2		3	2			2
CO5						2		3	2			2
Average						2		3	2			2

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1			2	
CO2			2	
CO3			2	
CO4			2	
CO5			2	
Average			2	

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr.A.P.J.Abdul Kalam Technical University]

B.Tech. VII Semester

Electronics and Communication Engineering

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS-701/ KAS-702	Industrial Management /Managerial Economics	3	0	0	30	20	50		100		150	3
2	KEC-071-074	Department Elective-IV	3	0	0	30	20	50		100		150	3
3	KEC-075-078	Department Elective-V	3	0	0	30	20	50		100		150	3
4	KOE-71-076	Open Elective-II	3	0	0	30	20	50		100		150	3
5	KEC-751*x	Department Elective-* Lab	0	0	2				25		25	50	1
6	KEC-752	Mini Project/ Internship Assessment**	0	0	2				50			50	1
7	KEC-753	Project	0	0	8				150			150	4
8		MOOCs (Essential for Hons. Degree)											
		Total										**850**	**18**

**The Mini Project or Internship (4weeks) conducted during summer break after VI Semester and will be assessed during VII Semester.

Department Elective-IV

KEC-071- Digital Image Processing
KEC-072- Optical Communication & Network
KEC-073- Modern Control System
KEC-074- Internet of Things

Department Elective-V

KEC-075-Information Theory & Coding
KEC-076- Wireless & Mobile Communication
KEC-077- Micro & Smart Systems
KEC-078- Speech Processing

***Department Elective Lab**

KEC-751A Digital Image Processing Lab
KEC-751B Optical Communication Lab
KEC-751C Modern Control System Lab
KEC-751D Internet of Things Lab

Open Elective-II

KOE-071	Machine Learning
KOE-072	Industrial Instrumentation
KOE-073	Non Conventional Energy Resources
KOE-074	Filter Design
KOE-075	Operations Research
KOE-076	Value Relationship & Ethical Human Conduct- For a Happy & Harmonious Society

Raj Kumar Goel Institute of Technology

[Approved by AICTE Affiliated to Dr. A.P.J. Abdul Kalam Technical University]

B.Tech. VIII Semester Electronics and Communication Engineering

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS-801/ KAS-802	Industrial Management /Managerial Economics	3	0	0	30	20	50		100		150	3
2	KOE-081-087	Open Elective-III	3	0	0	30	20	50		100		150	3
3	KOE-088-094	Open Elective–IV	3	0	0	30	20	50		100		150	3
4	KEC-851	Industrial Project	0	0	18				100		300	400	9
5		MOOCs (Essential for Hons. Degree)											
		Total										**850**	**18**

Open Elective –III

KOE-081	Bio Medical Instrumentation
KOE-082	Computerized Process Control
KOE-083	Entrepreneurship Development
KOE-084	Digital and Social Media Marketing
KOE-085	Fuzzy Logic & Neural Network
KOE-086	Quality Management
KOE-087	Human Values in Madhyasth Darshan

Open Elective –IV

KOE-088	Database Management System and Data Mining and Warehousing
KOE-089	Modeling of Field-Effect Nano Devices
KOE-090	Analytical Instrumentation
KOE-091	Nonlinear Dynamic Systems
KOE-092	Automation and Robotics
KOE-093	Human Values in Buddha and Jain Darshan
KOE-094	Human Values In Sankhay Yoga and Vedanta Darsan

Raj Kumar Goel Institute of Technology

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Sub Code	**KHU 801**
Sub. Name	**Project Management and Entrepreneurship**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the need, scope, competencies, and conceptual model of entrepreneurship.	K1
CO2	Able to know the importance, of entrepreneurial idea generation techniques, and sustaining enterprising model.	K2
CO3	Understand the meaning, need, and scope of Project management and the role of the Project Manager.	K1
CO4	Understand Project cost estimation & working capital requirements.	K3
CO5	Understand Social Sector Perspectives and Social Entrepreneurship.	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	-	3	2	-	-	-
CO2	2	-	-	-	-	2	-	3	-	-	-	2
CO3	-	-	-	-	-	-	-	3	3	-	-	-
CO4	2	3	-	2	-	-	-	3	2	-	3	2
CO5	2	-	-	-	-	2	-	3	2	-	-	-
Average	1.2	0.6	-	0.4	0	1.2	0	3	1.8	0	0.6	0.8

CO-PSO Matrix (Civil Engineering)

COs	PSO1	PSO2	PSO3	
CO1	-	-	-	
CO2	-	-	-	
CO3	-	-	3	
CO4	-	-	3	
CO5	-	-	-	
Average	-	-	1.2	

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Sub Code	**KEC-071**
Sub. Name	**Digital Image Processing**

COURSE OUTCOMES		**Bloom's Level**
CO1	Describe the concept and need for image processing	K2
CO2	Implement the various techniques for image enhancement and restoration both in spatial and frequency domains.	K3
CO3	Interpret the various types of image transforms and their properties	K3
CO4	Distinguish between lossless and lossy image compression algorithms and examine their performances in spatial and frequency domains.	K4
CO5	Examine the various image segmentation techniques.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2		2						
CO2	3	3	3	2		2						
CO3	3	3	3	2		2						
CO4	3	3	3	2		2						
CO5	3	3	3	2		2						
Average	3	3	3	2		2						

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3		-	-
CO2	3		-	-
CO3	3		-	-
CO4	3		-	-
CO5	3		-	-
Average	3		-	-

Raj Kumar Goel Institute of Technology

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Sub Code	**KEC-072**
Sub. Name	**VLSI DESIGN**

COURSE OUTCOMES		**Bloom's Level**
CO1	Express the concept of VLSI design and CMOS circuits and delay study	K4
CO2	Analyze mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits.	K4
CO3	Design and analyze various combinational & sequential circuits based on CMOS technology.	K6
CO4	Examine power logic circuits and different semiconductor memories used in present day technology	K5
CO5	Interpret faults in digital circuits, Fault Models and various Testing Methodologies	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	2							2
CO2	3	3	3	3	2							3
CO3	3	3	3	3	3							3
CO4	3	2	2	3	3							3
CO5	3	2	2	3	3							3
Average	**3**	**2**	**2**	**3**	**3**							**3**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3
CO1	2	2	
CO2	2	2	
CO3	2	2	
CO4	2	2	
CO5	2	2	
Average	**2**	**2**	

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Sub Code	**KOE-074**
Sub. Name	**Renewable Energy Resources**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the various forms of conventional energy resources.	K2
CO2	Understand the present energy scenario and the need for energy conservation.	K2
CO3	Explain the concept of various forms of renewable energy.	K2
CO4	Outline division aspects and utilization of renewable energy sources for both domestics and industrial application.	K3
CO5	Analyze the environmental aspects of renewable energy resources.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2				3	3					2
CO2	3	2				3	3					2
CO3	3	2				3	3					2
CO4	3	2				3	3					2
CO5	3	2				3	3					2
Average	3	2				3	3					2

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2		2	
CO2	2		2	
CO3	2		2	
CO4	2		2	
CO5	3		2	
Average	3		2	

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Sub Code	KEC-076
Sub. Name	Wireless & Mobile Communication

COURSE OUTCOMES		Bloom's Level
CO1	Familiarize with various generations of mobile communications and Understand the concept of cellular communication.	K3
CO2	Understand the basics of wireless communication.	K 4
CO3	Understand GSM mobile communication standard, its architecture, logical channels, advantages and limitations.	K 3
CO4	Gain knowledge of IS-95 CDMA mobile communication standard, its architecture, logical channels, advantages and limitations.	K 4
CO5	Gain knowledge of 3G mobile standards and their comparison with 2G technologies	K 3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	2							2
CO2	3	3	3	3	2							2
CO3	3	2	2	3	3							3
CO4	2	3	3	3	3							3
CO5	3	3	2	3	3							2
Average	2.8	2.8	2.4	3	2.6							2.4

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3		
CO2	3	3		
CO3	3	2		
CO4	2	3		
CO5	3	3		
Average	2.8	2.8		

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Sub Code	**KEC-751A**
Sub. Name	**Digital Image Processing Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Explain image processing operations using MATLAB tool.	K-2
CO2	Evaluate the appropriate methods for image enhancement and image restoration.	K-5
CO3	Formulate spatial and frequency domain filters to obtain better quality image.	K-6
CO4	Select various attributes of image such as texture and edges from the image.	K-5
CO5	Design and develop the applications of transforms such as DCT and wavelet.	K-6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2			2	3		2	
CO2	3	3	3	3	3			2	3		2	
CO3	3	3	3	3	2			2	3		2	
CO4	3	3	3	3	2			2	3		2	
CO5	3	3	3	3	3			2	3		2	
Average	3	3	3	3	2			2	3		2	

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	3		
CO2	2	3		
CO3	2	3		
CO4	2	3		
CO5	2	3		
Average	2	3		

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Sub Code	**KEC-751B**
Sub. Name	**VLSI DESIGN LAB**

COURSE OUTCOMES		**Bloom's Level**
CO1	Designing of logic gates.	K6
CO2	Implementation of combinational and sequential circuits using CMOS logic.	K3
CO3	Analyze amplifier circuits.	K4
CO4	Design sequential circuits such as flip flop.	K6
CO5	Do the layout designing for physical analysis of the MOS transistor and MOS based circuits	K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3				2	3		
CO2	3	3	3	3	3				2	3		
CO3	3	3	3	3	3				2	3		
CO4	3	3	3	3	3				2	3		
CO5	3	3	3	3	3				2	3		
Average	**3**	**3**	**3**	**3**	**3**				**2**	3		

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3		
CO2	3	3		
CO3	3	3		
CO4	3	3		
CO5	3	3		
Average	3	3		

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Sub Code	**KEC-753**
Sub. Name	**Project I**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply techniques/principles in their project.	K-2
CO2	Evaluate team work and time planning in the project.	K-4
CO3	Develop effective communication skills by delivering presentations on project.	K-5
CO4	Analyze the problem identification, formulation and solution in the engineering domain.	K-2
CO5	Discuss components used, simulation, and interpretation of results and validity of project.	K-2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	3					3
CO2								3	3	3	3	3
CO3					2		3	3	3	3	3	3
CO4	3	3	3	3	3	3	3		3	3	3	3
CO5	3	3	3	3	3	3	3		3	3	3	3
Average	3	3	3	3	2.75	3	3	3	3	3	3	3

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3		
CO2			3	
CO3	3	3	3	
CO4	3	3	3	
CO5	3	3	3	
Average	3	3	3	

Raj Kumar Goel Institute of Technology

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Sub Code	**KOE-083**
Sub. Name	**Entrepreneurship Development**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the theories of entrepreneurship and Entrepreneurial Development Program.	K2
CO2	Understand the importance of Project Management and Project's life cycle.	K2
CO3	Analyze the concept of Accountancy and Preparation of balance sheets.	K4
CO4	Understand the importance of Project Planning and Control.	K2
CO5	Analyze Social Sector Perspectives and Social Entrepreneurship regarding laws concerning entrepreneur.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									2		3	
CO2						2	2		3		3	2
CO3						3	3		3		3	2
CO4						2	3		3		3	2
CO5						2	3		2		3	3
Average						**2.2**	**2.7**		**2.6**		**3**	**2.2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1			2	
CO2			2	
CO3				
CO4			2	
CO5			3	
Average			**2.2**	

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Sub Code	KOE--094
Sub. Name	DIGITAL & SOCIAL MEDIA MARKETING

COURSE OUTCOMES		Bloom's Level
CO1	Student will develop and understanding of digital and social media Marketing practices.	K3
CO2	Student will develop understanding of the concept of social media platforms	K5
CO3	Student will acquire the skill to acquire and engage consumers online.	K3 K6
CO4	Student will develop understanding of building organizational competencies by way of digital marketing practices and cost considerations	K6
CO5	Student will develop understanding of the latest digital practices for marketing and communications.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	2	3	1	-	-	-	-	-	2
CO2	2	1	2	2	3	1	-	-	-	-	-	2
CO3	2	1	2	2	3	1	-	-	-	-	-	2
CO4	2	2	2	2	3	1	-	-	-	-	-	2
CO5	2	1	2	2	3	1	-	-	-	-	-	2
Average	2	1.2	2	2	3	1	-	-	-	-	-	2

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3	2	
CO2	3	3	2	
CO3	3	3	2	
CO4	3	3	2	
CO5	2	-	-	
Average	2.2	2	-	

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[Approved by AICTE Affiliated to Dr. A.P.J. Abdul Kalam Technical University]

Sub Code	**KHU-801**
Sub. Name	**Rural Development: Administration Planning**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the definitions, concepts and components of rural development	K2
CO2	Understand importance, structure, significance, resource of Indian rural economy	K2
CO3	Will have a clear idea about the area development programmes and its impact	K2
CO4	Will be able to acquire knowledge about rural entrepreneurship	K2
CO5	Will be able to understand about the using of different methods for human resource planning	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		2		2		2	2	2	2	2
CO2	2	2	2	3	2	2	2		2	2	3	2
CO3	2			3		2	2	2	2	2	3	2
CO4	2		3	2		3	3	2	2	2	2	2
CO5	2	2	3	2	3	2	2	2	2	2	3	2
Average	2	2	2.6	2.4	2.5	2.2	2.25	2	2	2	2.6	2

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2		2	
CO2			2	
CO3			2	
CO4	3	2	3	
CO5	2		2	
Average	2.3	2	2.2	

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Sub Code	**KEC-851**
Sub. Name	**Project II**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply techniques/principles in their project.	K-2
CO2	Evaluate team work and time planning in the project.	K-4
CO3	Develop effective communication skills by delivering presentations on project.	K-5
CO4	Analyze the problem identification, formulation and solution in the engineering domain.	K-2
CO5	Discuss components used, simulation, and interpretation of results and validity of project.	K-2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	3					3
CO2								3	3	3	3	3
CO3					2		3	3	3	3	3	3
CO4	3	3	3	3	3	3	3		3	3	3	3
CO5	3	3	3	3	3	3	3		3	3	3	3
Average	3	3	3	3	2.75	3	3	3	3	3	3	3

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	3		
CO2			3	
CO3	3	3	3	
CO4	3	3	3	
CO5	3	3	3	
Average	3	3	3	

Raj Kumar Goel Institute of Technology, Ghaziabad

Sessional Test – 1 (Odd Semester 2022-23)

B.Tech. [Branch/Sections- ECE/A], SEM- V

Subject Name: VLSI Technology **Roll No.:** _____ **Subject Code : KEC-053**	**Max. Marks : 50** **Time : 1.5 Hour**
Instructions :	1. *All questions are compulsory* 2. *Assume missing data suitably, if any*

CO1	Statement of CO1: Interpret the basics of crystal growth, wafer preparation and wafer cleaning.
CO2	Statement of CO2: Evaluate the process of Epitaxy and oxidation

	Section – A (5X2 =10 Marks)			
1(a).	What is Gettering?	CO 1	K 1	2
1(b).	Name the operations involved in the conversion of Si ingots into polished wafers.	CO 1	K 2	2
1(c).	What are four generations of Integration Circuits?	CO 1	K 1	2
1(d).	Define Homo and Hetero Epitaxy.	CO 2	K 1	2
1(e).	What is the process used in In-situ cleaning during VPE?	CO 2	K 2	2
	Section – B (4X5 = 20 Marks)			
2(a).	Why we prefer Silicon over Germanium?	CO 1	K 1	5
2(b).	Describe different types of defects in Silicon Crystal?	CO 1	K 2	5
2(c).	What are advantages of MBE over VPE?	CO 2	K 1	5
2(d).	Explain different types of Epitaxial Reactors with suitable diagram.	CO 2	K 5	5
	Section – C (2X10 = 20 Marks)			
3(a).	What is EGS. Describe briefly the production of MGS in the submerged electrode arc furnace with reaction using neat diagram	CO 1	K 1/4	10
	----OR-----			
3(b).	Explain the function of a Puller (CZ) with its four subsystems using neat diagram	CO 1	K 5	10
4(a).	Explain Vapour Pressure Epitaxy with si-Epitaxy reactions. What is Auto-Doping?	CO 2	K 1/5	10
	----OR----			
4(b).	Explain MBE with suitable diagram.	CO 2	K 5	10

24/9/22

Raj Kumar Goel Institute of Technology, Ghaziabad

Sessional Test – 2 (Odd Semester 2022-23)

B.Tech. [Branch/Sections: ECE/A&B], SEM- VII

Subject Name:VLSI DESIGN **Roll No.:** _____ **Subject Code : KEC-072**	**Max. Marks : 50** **Time : 1.5 Hour**

Instructions :

1. *All questions are compulsory*
2. *Assume missing data suitably, if any*

CO2	Analyze mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits.
CO3	Design and analyze various combinational & sequential circuits based on CMOS technology.

	Section – A (5X2 =10 Marks)			
1(a).	Enlist the type of interconnects.	CO 2	K 4	2
1(b).	Define logical effect with example.	CO 2	K 1	2
1(c).	Explain charge sharing in dynamic logic.	CO 3	K 2	2
1(d).	List out layout design rules.	CO 3	K 4	2
1(e).	Implement 2:1 MUX using CMOS transmission gate.	CO 3	K 4	2
	Section – B (4X5 = 20 Marks)			
2(a).	Discuss the scaling with example.	CO 2	K 6	5
2(b).	Discuss static power and dynamic power with expression.	CO 3	K 6	5
2(c).	Analyze the NP DOMINO logic.	CO 3	K 3	5
2(d).	Explain cascading problem in Dynamic CMOS Logic.	CO 3	K 4	5
	Section – C (2X10 = 20 Marks)			
3(a).	Draw and explain the working of RC delay model for interconnects.	CO 2	K 4	10
	----OR-----			
3(b).	Discuss logical effort of the path and path delay.	CO 2	K 6	10
4(a).	Implement SR latch with the help of CMOS and explain its working.	CO 3	K 4	10
	----OR-----			
4(b).	Draw and explain NORA and TSPC dynamic CMOS logic.	CO 3	K 4	10