



IMS Engineering College, Ghaziabad

**Department
of
Electronics & Communication
Engineering**

2020-21



IMS Engineering College, Ghaziabad

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



Institute Vision and Mission

Vision

Our vision is to impart Vibrant, Innovative and Global Education to make IMS the world leader in terms of Excellence of Education, Research and to serve the nation in the 21st century.

Mission

- To develop IMSEC as a Centre of Excellence in Technical and Management Education.
- To inculcate in its students the qualities of Leadership, Professionalism, Executive Competence and Corporate understanding.
- To imbibe and enhance Human Values, Ethics and Morals in our students.
- To transform students into Globally Competitive Professionals



Department Vision and Mission

Vision

To produce highly competent engineers by imparting innovative and accomplished information through global education and adequately prepare them to face the challenges of outside world by fulfilling the requirements of Electronics & Communication industries.

Mission

- To make the department a center of excellence in Electronics & Communication Engineering and to produce eminent engineers.
- To inculcate professionalism, team work, leadership qualities by imbibing high human values and professional ethics, in students.
- To enhance the employability of students by giving interdisciplinary knowledge to meet the need of society and become globally competitive professionals.
- To become a center for research in the stream of Electronics & Communication Engineering and to provide excellent learning environment for researchers by promoting research activities in the department.



Program Outcomes

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. 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.
3. 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.
4. 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.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. 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.
7. 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.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. 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.
11. 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.
12. 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.



Program Educational Objectives (PEOs)

- PEO1: Graduates will excel in Electronics & Communication Engineering, both in industrial and academic sectors by applying their technical skills and knowledge in a professional manner.
- PEO2: Graduates will be capable of effectively analyzing and solving engineering problems utilizing appropriate techniques and advanced engineering tools.
- PEO3: Graduates will be capable of applying their knowledge both in individual & multidisciplinary environments. They will also demonstrate excellent communication skills and caliber to work as a team.
- PEO4: Graduates will realize the significance of environmental concerns while keeping safety, ethical and societal values into consideration.
- PEO5: Graduates will be capable of implementing outputs derived from research-based knowledge in projects, analysis and interpretation of data leading to development of new processes and systems.

Program Specific Outcomes (PSO)

At the end of program, the student will have:

1. An ability to exhibit knowledge acquired from mathematics, engineering fundamentals, Electronics & Communication engineering and related fields for professional excellence in industry and research organizations.
2. An ability to solve and communicate complex Electronics and Communication Engineering problems, using latest hardware and software tools, along with analytical skills to arrive at cost effective and appropriate solutions.
3. Wisdom of social and environmental awareness along with ethical responsibility to have a successful career and to sustain passion and zeal for real-world applications using optimal resources as an Entrepreneur.
4. An ability to select appropriate techniques, resources for execution of projects and function effectively as an individual as well as a team member in multidisciplinary diverse environments.



IMS Engineering College, Ghaziabad

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	P S	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	1	0	30	20	50			100		150	3
			3	0	0									
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.



IMS Engineering College, Ghaziabad

Sub Code	KAS 302
Sub. Name	Maths IV

COURSE OUTCOMES		Bloom's Level
CO1	The students will be able to learn the idea of partial differentiation and types of partial differential equations	
CO2	The students will be able to learn the idea of classification of second partial differential equations, wave, heat equation and transmission lines	
CO3	The students will be able to learn the basic ideas of statistics including measures of central tendency, correlation, regression and their properties.	
CO4	The students will be able to learn the idea s of probability and random variables and various discrete and continuous probability distributions and their properties.	
CO5	The students will be able to learn the statistical methods of studying data samples, hypothesis testing and statistical quality control, control charts and their properties.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	1	-	-	-	-	1	-	-
CO2	3	2	1	-	-	-	-	-	-	-	-	1
CO3	3	2	1	1	-	-	-	-	-	1	1	1
CO4	3	2	1	1	1	-	-	-	-	-	1	1
CO5	3	2	1	3	1	-	1	-	-	1	1	1
Avg	3.00	2.00	1.00	1.67	1.00	-	1.00	-	-	1.00	1.00	1.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-
CO2	3	-	-	-
CO3	3	1	-	-
CO4	3	1	-	-
CO5	3	2	-	1
Avg	3.00	1.33	-	1.00



IMS Engineering College, Ghaziabad

Sub Code	KAS301
Sub. Name	Technical Communication

COURSE OUTCOMES		Bloom's Level
CO1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as engineers.	
CO2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	
CO3	Students would imbibe inputs by presentation skills to enhance confidence in face diverse audience.	
CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	
CO5	It would enable them to evaluate their efficiency as fluent & efficient communicators by learning the voice-dynamics.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	-	1	2	1	1	3	3	2	1
CO2	1	2	3	3	3	2	-	-	-	3	2	3
CO3	1	2	3	2	3	2	1	2	3	3	2	3
CO4	2	2	3	1	3	3	-	1	3	3	3	3
CO5	1	1	3	1	1	-	3	3	3	3	1	3
Avg	1.20	1.60	2.80	1.75	2.20	2.25	1.67	1.75	3.00	3.00	2.00	2.60

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	-	1	1
CO2	1	2	1	3
CO3	2	3	2	2
CO4	3	2	3	3
CO5	-	-	1	1
Avg	2.00	2.33	1.60	2.00



IMS Engineering College, Ghaziabad

Sub Code	KEC 301
Sub. Name	Electronic Devices

COURSE OUTCOMES		Bloom's Level
CO1	Understand the principles of semiconductor Physics.	
CO2	Understand and utilize the mathematical models of semiconductor junctions.	
CO3	Understand carrier transport in semiconductors and design resistors.	
CO4	Utilize the mathematical models of MOS transistors for circuits and systems.	
CO5	Analyse and find application of special purpose diodes.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1	-	-	-	-	1	1	2
CO2	2	3	2	2	2	-	-	-	-	1	1	1
CO3	1	2	3	2	2	-	-	-	-	1	2	2
CO4	3	3	3	3	3	-	-	-	-	1	3	2
CO5	2	1	1	1	1	-	-	-	-	1	3	2
Avg	2.00	2.00	2.00	1.80	1.80	-	-	-	-	1.00	2.00	1.80

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	1
CO2	2	1	-	1
CO3	3	2	-	3
CO4	3	2	-	3
CO5	1	1	-	2
Avg	2.20	1.40	-	2.00



IMS Engineering College, Ghaziabad

Sub Code	KEC 302
Sub. Name	Digital System Design

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	1	1	-	-	1	3	2	3
CO2	3	3	3	3	2	1	-	-	1	2	2	3
CO3	2	2	2	2	1	1	-	-	1	1	2	3
CO4	2	2	2	2	2	1	-	-	2	2	2	3
CO5	3	3	3	3	3	1	-	-	2	1	2	3
Avg	2.40	2.40	2.40	2.40	1.80	1.00	-	-	1.40	1.80	2.00	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	2
CO2	3	3	1	3
CO3	2	2	1	1
CO4	3	3	1	3
CO5	3	3	1	3
Avg	2.60	2.60	1.00	2.40



IMS Engineering College, Ghaziabad

Sub Code	KEC 303
Sub. Name	Network Analysis and Synthesis

COURSE OUTCOMES		Bloom's Level
CO1	Understand basics electrical circuits with nodal and mesh analysis.	
CO2	Appreciate electrical network theorems.	
CO3	Apply Laplace transform for steady state and transient analysis.	
CO4	Determine different network functions.	
CO5	Appreciate the frequency domain techniques.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	1	-	-	1	1	2	2
CO2	3	3	2	2	2	1	-	-	1	1	2	2
CO3	2	2	1	2	2	-	-	-	1	1	1	1
CO4	2	2	1	1	2	-	-	-	1	1	1	1
CO5	3	3	1	2	2	-	-	-	1	1	1	1
Avg	2.60	2.60	1.40	1.80	2.00	1.00	-	-	1.00	1.00	1.40	1.40

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	2
CO2	3	2	-	2
CO3	2	2	-	1
CO4	2	2	-	1
CO5	2	2	-	1
Avg	2.40	2.00	-	1.40



IMS Engineering College, Ghaziabad

Sub Code	KEC 351
Sub. Name	Electronic Devices Lab

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	1	2	1	-	-	-	1	3
CO2	3	2	2	2	2	2	1	-	-	-	2	3
CO3	3	2	2	2	2	2	1	-	-	-	1	3
CO4	3	3	2	2	2	2	1	-	-	-	1	3
CO5	3	3	1	2	2	2	1	-	-	-	2	3
Avg	3.00	2.40	1.80	1.80	1.80	2.00	1.00	-	-	-	1.4	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	1
CO2	3	3	1	2
CO3	2	2	-	1
CO4	2	2	-	1
CO5	3	3	1	2
Avg	2.40	2.40	1.00	1.40



IMS Engineering College, Ghaziabad

Sub Code	KEC 352
Sub. Name	Digital System Design Lab

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2	-	-	-	3	1	2	3
CO2	3	2	2	3	3	-	-	-	3	1	2	3
CO3	2	3	3	2	2	-	-	-	2	1	3	3
CO4	3	3	3	2	2	-	-	-	3	1	2	3
Avg	2.75	2.75	2.75	2.25	2.25	-	-	-	2.75	1.00	2.25	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	3
CO2	3	2	1	3
CO3	3	3	1	3
CO4	3	3	1	3
Avg	3.00	2.50	1.00	3.00



IMS Engineering College, Ghaziabad

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.	
CO2	Appreciate electrical network theorems.	
CO3	Analyse RLC circuits.	
CO4	Determine the stability of an electrical circuit.	
CO5	Design network filters.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2	1	1	-	-	-	1	3
CO2	3	3	3	2	2	1	1	-	-	-	1	3
CO3	3	3	3	2	2	1	1	-	-	-	1	3
CO4	3	3	3	2	2	1	1	-	-	-	1	3
CO5	3	3	3	2	2	1	1	-	-	-	2	3
Avg	3.00	3.00	3.00	2.00	2.00	1.00	1.00	-	-	-	1.20	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	1
CO2	3	3	-	1
CO3	3	3	-	1
CO4	3	3	-	2
CO5	3	3	-	2
Avg	3.00	3.00	-	1.40



IMS Engineering College, Ghaziabad

Sub Code	KNC 302
Sub. Name	Python Programming

COURSE OUTCOMES		Bloom's Level
CO1	To read and write simple Python programs.	
CO2	To develop Python programs with conditionals and loops.	
CO3	To define Python functions and to use Python data structures -- lists, tuples, dictionaries	
CO4	To do input/output with files in Python	
CO5	To do searching, sorting and merging in Python	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	2	-	1	-	3	-	-	-	-	1	2
CO2	1	1	-	-	-	3	2	2	-	-	-	-
CO3	-	1	-	1	-	3	2	-	2	-	1	-
CO4	1	-	-	1	-	-	2	2	-	-	-	-
CO5	-	2	-	-	-	-	3	3	-	-	1	2
Avg	1	1.20	-	1	-	3	2.2	2.2	2	-	1	2

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	3
CO2	2	2	-	3
CO3	2	2	-	3
CO4	2	2	-	2
CO5	2	2	-	2
Avg	2	2.2	-	2.6



IMS Engineering College, Ghaziabad

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	0	0	30	20	50		100		150	3
			2	1	0								
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



IMS Engineering College, Ghaziabad

Sub Code	KOE 044
Sub. Name	Sensor and Instrumentation

COURSE OUTCOMES		Bloom's Level
CO1	Apply the use of sensors for measurement of displacement, force and pressure.	
CO2	Employ commonly used sensors in industry for measurement of temperature, position, accelerometer, vibration sensor, flow and level.	
CO3	Demonstrate the use of virtual instrumentation in automation industries.	
CO4	Identify and use data acquisition methods.	
CO5	Comprehend intelligent instrumentation in industrial automation.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	1	1	-	2	1	1	3
CO2	3	3	3	3	3	2	1	-	2	1	2	3
CO3	3	3	3	3	3	2	1	-	2	1	2	3
CO4	3	3	3	3	3	1	1	-	2	1	1	3
CO5	3	3	3	3	3	2	1	-	2	1	2	3
Avg	3.00	3.00	3.00	3.00	3.00	1.60	1.00	-	2.00	1.00	1.60	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	3
CO2	3	3	1	3
CO3	3	3	2	3
CO4	3	3	1	3
CO5	3	3	2	3
Avg	3.00	3.00	1.40	3.00



IMS Engineering College, Ghaziabad

Sub Code	KVE 401
Sub. Name	Universal Human Values and Professional Ethics

COURSE OUTCOMES		Bloom's Level
CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	
CO4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	
CO5	Distiguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	1	1	2	2	3	2	-	1	2
CO2	-	-	2	1	-	3	1	2	-	2	-	-
CO3	-	-	-	-	-	2	2	3	-	-	-	1
CO4	-	2	2	-	-	2	1	2	1	1	1	1
CO5	-	-	1	-	1	2	-	3	2	-	-	-
Avg	-	2.00	1.67	1.00	1.00	2.20	1.50	2.60	1.67	1.50	1.00	1.33

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	-	-	3	2
CO2	-	-	1	1
CO3	-	-	1	1
CO4	-	-	1	1
CO5	-	-	3	2
Avg	-	-	1.8	1.4



IMS Engineering College, Ghaziabad

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	
CO2	Analyze the behavior of a communication system in presence of noise	
CO3	Investigate pulsed modulation system and analyze their system performance	
CO4	Investigate various multiplexing techniques	
CO5	Analyze different digital modulation schemes and compute the bit error performance	

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	2	2	1	-	-	-	-	3
CO3	3	3	3	2	1	1	-	-	-	-	-	3
CO4	3	3	3	2	1	1	-	-	-	-	-	3
CO5	3	3	3	2	2	1	1	-	-	-	-	3
Avg	3.00	3.00	3.00	2.00	1.40	1.40	1.00	-	-	-		3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	1
CO2	3	2	-	1
CO3	3	3	-	1
CO4	3	2	-	1
CO5	3	3	-	1
Avg	3.00	2.40	-	1.00



IMS Engineering College, Ghaziabad

Sub Code	KEC 402
Sub. Name	Analog Circuits

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	1	-	-	-	-	1	2
CO2	3	3	2	3	2	1	-	-	-	-	1	2
CO3	3	3	2	3	2	-	-	-	-	-	1	2
CO4	3	3	3	3	2	1	-	-	-	-	1	3
CO5	3	3	3	3	2	-	-	-	-	-	1	3
Avg	3.00	3.00	2.60	3.00	2.00	1.00	-	-	-	-	1.00	2.40

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	1
CO2	3	3	1	2
CO3	3	3	1	2
CO4	3	3	1	2
CO5	3	3	1	1
Avg	3.00	3.00	1.00	1.60



IMS Engineering College, Ghaziabad

Sub Code	KEC 403
Sub. Name	Signal System

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	-	-	-	-	-	-	3
CO2	3	3	3	2	2	-	-	-	-	-	-	3
CO3	3	3	3	3	2	-	-	-	-	-	-	3
CO4	3	3	3	2	2	-	-	-	-	-	-	3
CO5	3	3	3	3	2	-	-	-	-	-	-	3
Avg	3	3	2.8	2.2	1.8	-	-	-	-	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	1
CO3	3	3	1	1
CO4	3	2	1	1
CO5	3	1	1	1
Avg	3	2.2	1	1



IMS Engineering College, Ghaziabad

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.	
CO2	Study pulse amplitude modulation.	
CO3	Analyze different digital modulation schemes and can compute the bit error performance.	
CO4	Study and simulate the Phase shift keying	
CO5	Design a front end BPSK modulator and demodulator.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2	-	-	-	-	-	-	3
CO2	3	3	3	2	2	-	-	-	-	-	-	3
CO3	3	3	3	2	2	-	-	-	-	-	-	3
CO4	3	3	3	2	2	-	-	-	-	-	-	3
CO5	3	3	3	2	2	-	-	-	-	-	-	3
Avg	3.00	3.00	3.00	2.00	2.00	-	-	-	-	-	-	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	3
CO2	3	2	-	2
CO3	3	2	-	2
CO4	3	2	-	3
CO5	3	2	-	2
Avg	3.00	2.00	-	2.40



IMS Engineering College, Ghaziabad

Sub Code	KEC 452
Sub. Name	Analog Circuits Lab

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	-	-	-	-	-	-	2
CO2	3	2	2	2	2	-	-	-	-	-	-	2
CO3	3	2	2	2	2	-	-	-	-	-	-	2
CO4	3	2	2	2	1	-	-	-	-	-	-	2
CO5	3	2	2	2	1	-	-	-	-	-	-	2
Avg	3.00	2.00	1.80	1.80	1.60	-	-	-	-	-	-	2.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	1
CO2	2	3	-	2
CO3	2	3	-	2
CO4	3	3	-	3
CO5	3	3	-	2
Avg	2.40	2.80	-	2.00



IMS Engineering College, Ghaziabad

Sub Code	KEC 453
Sub. Name	Signal System Lab

COURSE OUTCOMES		Bloom's Level
CO1	Understand the basics operation of MATLAB.	
CO2	Analysis the time domain and frequency domain signals.	
CO3	Implement the concept of Fourier series and Fourier transforms.	
CO4	Find the stability of system using pole-zero diagrams and bode diagram.	
CO5	Design frequency response of the system.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	3	-	-	-	2	-	-	3
CO2	3	3	2	2	3	-	-	-	2	-	-	3
CO3	3	3	2	2	3	-	-	-	2	-	-	3
CO4	3	3	2	2	3	-	-	-	2	-	-	3
CO5	3	3	2	2	3	-	-	-	2	-	-	3
Avg	3	3	1.8	1.8	3	-	-	-	2	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	2
CO2	3	3	-	2
CO3	3	3	-	2
CO4	3	3	-	2
CO5	3	3	-	2
Avg	3	3	-	2



IMS Engineering College, Ghaziabad

Sub Code	KNC 401
Sub. Name	Computer System Security

COURSE OUTCOMES		Bloom's Level
CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	
CO2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	
CO3	To discover and explain mobile software bugs posing cyber security threats explain and recreate exploits, and to explain mitigation techniques.	
CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	
CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	2	-	1	-	3	-	-	-	-	1	2
CO2	1	1	-	-	-	-	2	2	-	-	-	-
CO3	-	1	-	1	-	3	2	-	2	-	1	-
CO4	1	-	-	1	-	-	2	2	-	-	-	-
CO5	-	2	-	-	-	-	3	3	-	-	1	2
Avg	1	1.20	-	1	-	3	2.2	2.2	2	-	1	2

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	2
CO2	2	1	3	2
CO3	2	2	3	2
CO4	2	1	2	2
CO5	2	1	3	2
Avg	2.00	1.20	2.60	2.00



IMS Engineering College, Ghaziabad

ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech. V 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	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	Digital Signal Processing	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-553	Digital Signal Processing Lab	0	0	2				25		25	50	1
9	KEC-554	Mini Project/Internship **	0	0	2				50			50	1
10	KNC501/KNC502	Constitution of India, Law and Engineering / Indian Tradition, Culture and Society	2	0	0	15	10	25		50			NC
11		MOOCs (Essential for Hons. Degree)											
		Total										950	22

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

Course Code	Course Title
	Department Elective-I
KEC-051	Computer Architecture and Organization
KEC-052	Industrial Electronics
KEC-053	VLSI Technology
KEC-054	Advance Digital Design using Verilog
	Department Elective-II
KEC-055	Electronics Switching
KEC-056	Advance Semiconductor Device
KEC-057	Electronics Measurement & Instrumentation
KEC-058	Optical Communication



IMS Engineering College, Ghaziabad

Sub Code	KEC 501
Sub. Name	Integrated Circuits

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	1	2
CO2	3	2	2	2	1	-	-	-	-	-	1	2
CO3	3	2	2	3	1	-	-	-	-	-	2	2
CO4	3	2	2	2	1	-	-	-	-	-	1	2
CO5	3	2	2	2	1	-	-	-	-	-	2	2
Avg	3.00	2.00	2.00	2.20	1.00	-	-	-	-	-	1.40	2.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	1
CO2	3	3	-	2
CO3	3	3	-	2
CO4	3	2	-	2
CO5	3	3	-	2
Avg	3.00	2.60	-	1.80



IMS Engineering College, Ghaziabad

Sub Code	KEC-502
Sub. Name	Microprocessor and Microcontroller

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	1	-	1	2	1	3
CO2	3	2	1	1	3	1	1	-	1	2	2	3
CO3	3	2	2	2	3	1	1	-	1	2	2	3
CO4	2	1	1	1	3	2	1	-	1	2	2	3
CO5	3	1	2	2	3	2	1	-	1	2	2	3
Avg	2.8	1.6	1.4	1.4	1.4	1.4	1	-	1	2	1.8	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2
CO2	1	2	1	1
CO3	2	2	1	1
CO4	3	2	2	2
CO5	3	2	2	1
Avg	2	2	1.4	1.4



IMS Engineering College, Ghaziabad

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.	
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.	
CO3	Design FIR filter using various types of window functions.	
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.	
CO5	Define the concept of decimation and interpolation. Also, they will be able to implement it in various practical applications.	

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

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	3	3	-	3
CO4	3	3	-	3
CO5	3	3	-	3
Avg	3	3	-	3



IMS Engineering College, Ghaziabad

Sub Code	KEC 054
Sub. Name	Advance Digital Design using Verilog

COURSE OUTCOMES		Bloom's Level
CO1	Describe mixed logic circuits and their implementation	
CO2	Implement combinational circuits using mixed logic and Verilog	
CO3	Design sequential circuits using mixed logic and Verilog with mapping of Algorithm	
CO4	Understand faults and its elimination in sequential and combinational circuits	
CO5	Understand the working of programmable logic families	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1	-	-	-	-	-	-	1
CO2	3	3	3	3	3	1	1	1	1	2	2	1
CO3	3	3	3	3	3	1	1	1	2	2	2	1
CO4	3	3	3	3	3	2	1	1	1	1	1	1
CO5	3	1	1	1	1	1	1	1	1	1	-	1
Avg	3.00	2.60	2.40	2.40	2.20	1.25	1.00	1.00	1.25	1.50	1.66	1.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	3
CO3	3	3	1	3
CO4	3	3	2	3
CO5	3	2	1	1
Avg	3.00	2.60	1.20	2.20



IMS Engineering College, Ghaziabad

Sub Code	KEC 058
Sub. Name	Optical Communication

COURSE OUTCOMES		Bloom's Level
CO1	Familiarize with basic concepts and theory of Optical Communication	
CO2	Demonstrate OPCOMM components, assemble them and solve problems on Optical Communication system	
CO3	Able to design, implements, analyse and maintains optical communication system	
CO4	Gain knowledge of different source of light as well as receiver and their comparative study	
CO5	To get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	-	-	1	2
CO2	3	3	3	2	2	1	1	-	-	-	1	3
CO3	3	3	3	3	2	1	1	1	2	2	1	3
CO4	3	3	3	1	1	1	1	-	-	-	-	3
CO5	3	3	3	3	2	1	1	1	1	1	1	3
Avg	3.00	3.00	2.60	2.00	1.75	1.00	1.00	1.00	1.50	1.50	1.00	2.80

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	1	-	1
CO2	3	2	2	3
CO3	3	3	3	3
CO4	2	2	1	1
CO5	3	3	3	2
Avg	2.80	2.20	2.25	2.00



IMS Engineering College, Ghaziabad

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.	
CO2	Explain and design different linear applications of operational amplifiers such as filters.	
CO3	Demonstrate the function of waveforms generator using op-Amp.	
CO4	Construct multivibrator and oscillator circuits using IC555 and IC566 and perform measurements of frequency and time.	
CO5	Design and practically demonstrate the applications based on IC555 and IC566.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	3	2	1	-	-	-	1	2	3
CO2	3	2	3	3	2	1	-	-	-	1	2	3
CO3	3	2	3	3	2	1	-	-	-	1	2	3
CO4	3	2	3	3	2	1	-	-	-	1	2	3
CO5	3	2	3	3	2	1	-	-	-	1	2	3
Avg	3	2	3	3	2	1	-	-	-	1	2	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	2
CO2	3	3	1	2
CO3	3	3	1	2
CO4	3	3	1	2
CO5	3	3	1	2
Avg	3	3	1	2



IMS Engineering College, Ghaziabad

Sub Code	KEC-552
Sub. Name	Microprocessor and Microcontroller Lab

COURSE OUTCOMES		Bloom's Level
CO1	To list and demonstrate arithmetic and logical operations on 8-bit data using microprocessor 8085.	
CO2	Examine 8085 & 8086 microprocessor and its interfacing with peripheral devices.	
CO3	State various conversion techniques using 8085 & 8086 and generate waveforms using 8085.	
CO4	Implement programming concept of 8051 Microcontroller.	
CO5	Design concepts to Interface peripheral devices with Microcontroller so as to design Microcontroller based projects.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	-	-	-	1	-	-	3
CO2	3	3	2	1	2	-	-	-	1	-	-	3
CO3	2	2	2	1	2	-	-	-	1	-	-	3
CO4	3	3	1	1	2	-	-	-	1	-	-	3
CO5	3	3	2	1	2	-	-	-	1	-	-	3
Avg	2.8	2.8	1.8	1	2	-	-	-	1	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	2	2	-	3
CO4	3	3	-	3
CO5	3	3	-	3
Avg	2.8	2.8	-	3



IMS Engineering College, Ghaziabad

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.	
CO2	Implement and test the basic operations of Signal processing.	
CO3	Examine and analyse the spectral parameters of window functions	
CO4	Design IIR and FIR filters for band pass, band stop, low pass and high pass filters.	
CO5	Design the signal processing algorithms using MATLAB/Scilab.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	-	-	-	1	-	-	3
CO2	3	3	2	1	2	-	-	-	1	-	-	3
CO3	3	3	2	1	2	-	-	-	1	-	-	3
CO4	3	3	2	1	2	-	-	-	1	-	-	3
CO5	3	3	2	1	2	-	-	-	1	-	-	3
Avg	3	3	2	1	2	-	-	-	1	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	3	3	-	3
CO4	3	3	-	3
CO5	3	3	-	3
Avg	3	3	-	3



IMS Engineering College, Ghaziabad

Sub Code	KNC 501
Sub. Name	Constitution of India, Law and Engineering

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	1	-	2
CO2	-	-	-	-	-	-	-	-	-	1	-	2
CO3	-	-	-	-	-	3	-	-	-	-	-	3
CO4	-	-	-	-	2	2	-	2	-	2	2	-
CO5	-	-	-	-	2	2	-	3	1	2	-	2
Avg	-	-	-	-	2.00	2.33	-	2.50	1.00	1.60	2.00	2.25

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-
CO2	-	-	-	-
CO3	-	-	-	-
CO4	1	-	2	2
CO5	-	-	-	-
Avg	1.00	-	2.00	2.00



ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech. VI 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	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		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	KEC-652	Control System Lab	0	0	2				25		25	50	1
8	KEC-653	Elective Lab	0	0	2				25		25	50	1
9	KNC601/ KNC602	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

Course Code

Course Title

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 & Instrumentation Lab
KEC-653B	Cad for Electronics Lab
KEC-653C	Microcontroller & Embedded System Design Lab



IMS Engineering College, Ghaziabad

Sub Code	KEC-601
Sub. Name	Digital Communication

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	-	-	-	-	-	-	3
CO2	3	3	2	1	1	-	-	-	-	-	-	3
CO3	3	3	2	2	2	-	-	-	-	-	-	3
CO4	3	3	2	2	2	-	-	-	-	-	-	3
CO5	3	3	2	2	2	-	-	-	-	-	-	3
Avg	3	3	2	1.6	1.6	-	-	-	-	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	1
CO3	3	3	1	1
CO4	3	2	1	1
CO5	3	1	1	1
Avg	3	2.2	1	1



IMS Engineering College, Ghaziabad

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 modelling of various physical systems along with modelling of DC servomotor.	
CO2	Explain the concept of state variables for the representation of LTI system.	
CO3	Interpret the time domain response analysis for various types of inputs along with the time domain specifications.	
CO4	Distinguish the concepts of absolute and relative stability for continuous data systems along with different methods.	
CO5	Interpret the concept of frequency domain response analysis and their specifications.	

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	2	3	3	-	-	-	-	-	1	3
CO3	3	3	3	3	3	1	-	-	-	-	1	3
CO4	3	3	3	3	3	1	-	-	-	-	1	3
CO5	3	3	3	3	3	1	-	-	-	-	1	3
Avg	3.00	3.00	2.80	2.80	2.80	1.00	-	-	-	-	1.00	2.80

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	1
CO2	3	3	1	2
CO3	3	3	1	2
CO4	3	3	1	2
CO5	3	3	1	2
Avg	3.00	3.00	1.00	1.80



IMS Engineering College, Ghaziabad

Sub Code	KEC-603
Sub. Name	Antenna & 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.	
CO2	Explain the concept of static electric field, current and properties of conductors.	
CO3	Express the basic concepts of ground, space, sky wave propagation mechanism.	
CO4	Demonstrate the knowledge of antenna fundamentals and radiation mechanism of the antenna.	
CO5	Analyze and design different types of basic antennas.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	-	-	-	-	-	-	3
CO2	3	3	2	1	1	-	-	-	-	-	-	3
CO3	3	3	2	2	2	-	-	-	-	-	-	3
CO4	3	3	2	2	1	-	-	-	-	-	-	3
CO5	3	3	2	2	2	-	-	-	-	-	-	3
Avg	3.00	3.00	2.00	1.60	1.40	-	-	-	-	-	-	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	1	1	1
Avg	3.00	2.00	1.00	1.00



IMS Engineering College, Ghaziabad

Sub Code	KEC-061
Sub. Name	MICROCONTROLLER & EMBEDDED SYSTEMS DESIGN

COURSE OUTCOMES		Bloom's Level
CO1	Explain the advance concept of 8051 architectures and AVR family architecture and compare them for different applications.	
CO2	To demonstrate the basics of MSP430x5x Microcontroller.	
CO3	To execute the I/O interfacing and peripheral devices associated with Microcontroller SoC (system on chip).	
CO4	Evaluate the data transfer information through serial & parallel ports and implement its interfacing with MSP430.	
CO5	Demonstrate the basics of IoT, WSN and its application sectors and design IoT based.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	1	-	1	2	1	3
CO2	3	2	1	1	3	1	1	-	1	2	2	3
CO3	3	1	1	1	3	1	1	-	1	2	2	3
CO4	3	2	2	2	3	2	1	-	1	2	2	3
CO5	2	1	2	2	3	2	1	-	1	2	2	3
Avg	2.8	1.6	1.4	1.4	1.4	1.4	1	-	1	2	1.8	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2
CO2	1	2	1	1
CO3	2	2	1	1
CO4	3	2	2	2
CO5	3	2	2	1
Avg	2	2	1.4	1.4



IMS Engineering College, Ghaziabad

Sub Code	KOE-062
Sub. Name	Embedded System

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

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	1	3	-	-	-	-	1
CO2	3	2	3	3	3	1	1	1	2	2	3	1
CO3	3	3	3	3	3	2	1	1	2	1	1	-
CO4	3	3	2	2	2	1	1	-	-	-	-	1
CO5	1	1	1	1	1	3	3	3	2	2	2	3
Avg	2.60	2.40	2.20	2.00	2.00	1.60	1.80	1.66	2.00	1.66	2.00	1.50

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	1	2	1
CO2	3	3	1	3
CO3	3	3	1	2
CO4	3	1	2	-
CO5	3	2	3	2
Avg	3.00	2.00	1.80	2.00



IMS Engineering College, Ghaziabad

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.	
CO2	To identify different line coding techniques and demonstrate the concepts.	
CO3	To design equipment's related to digital modulation and demodulation schemes.	
CO4	To analyse the performance of various digital communication systems and evaluate the key parameters.	
CO5	To conceptualize error detection & correction using different coding schemes in digital communication.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	-	-	-	2	-	-	3
CO2	3	3	2	1	2	-	-	-	2	-	-	3
CO3	3	3	2	2	2	-	-	-	2	-	-	3
CO4	3	3	2	3	2	-	-	-	2	-	-	3
CO5	3	3	2	3	2	-	-	-	2	-	-	3
Avg	3	3	2	2	2	-	-	-	2	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	3	3	-	3
CO4	3	3	-	3
CO5	3	3	-	3
Avg	3	3	-	3



IMS Engineering College, Ghaziabad

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.	
CO2	Evaluate the poles and zeros on s-plane along with transfer function of a given system.	
CO3	Construct state space model of a linear continuous system.	
CO4	Evaluate the various specifications of time domain response of a given system.	
CO5	Appraise the steady state error of a given transfer function.	
CO6	Examine the relative stability of a given transfer function using various methods such as root locus, Bode plot and Nyquist plot.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3	1	-	-	-	-	-	3
CO2	3	3	2	2	3	1	-	-	-	-	-	2
CO3	3	3	1	1	3	1	-	-	-	-	-	2
CO4	3	3	2	2	3	1	-	-	-	-	-	2
CO5	3	3	2	2	3	1	-	-	-	-	-	2
CO6	3	3	2	2	3	1	-	-	-	-	-	2
Avg	3.00	2.83	1.83	1.83	3.00	1.00	-	-	-	-	-	2.16

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	2
CO2	3	3	1	2
CO3	3	3	1	2
CO4	3	3	1	2
CO5	3	3	1	2
CO6	3	3	1	2
Avg	3.00	3.00	1.00	2.00



IMS Engineering College, Ghaziabad

Sub Code	KEC-653C
Sub. Name	Microcontroller and Embedded System Design Lab

COURSE OUTCOMES		Bloom's Level
CO1	To understand the basis work of microcontroller and learn the working.	
CO2	To understand the building blocks of embedded system.	
CO3	To learn the concept of interfacing with different devices	
CO4	To relate the concept of memory map and memory interface and to discover the characteristics of real time system.	
CO5	Demonstrate knowledge of programs environment and executing variety of programs.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	-	-	-	2	-	-	3
CO2	3	3	2	1	2	-	-	-	2	-	-	3
CO3	3	3	2	2	2	-	-	-	2	-	-	3
CO4	3	3	2	3	2	-	-	-	2	-	-	3
CO5	3	3	2	3	2	-	-	-	2	-	-	3
Avg	3	3	2	2	2	-	-	-	2	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	3	3	-	3
CO4	3	3	-	3
CO5	3	3	-	3
Avg	3	3	-	3



IMS Engineering College, Ghaziabad

Sub Code	KNC602
Sub. Name	INDIAN TRADITIONS, CULTURAL AND SOCIETY

COURSE OUTCOMES		Bloom's Knowledge Level
CO1	The course aims at imparting basic principles of thought process, reasoning and inference to identify the roots and details of some of the contemporary issues faced by our nation and try to locate possible solutions to these challenges by digging deep into our past.	K3
CO2	To enable the students to understand the importance of our surroundings and encourage the students to contribute towards sustainable development.	K4
CO3	To sensitize students towards issues related to 'Indian' culture, tradition and its composite character.	K4
CO4	To make students aware of holistic life styles of Yogic-science and wisdom capsules in Sanskrit literature that are important in modern society with rapid technological advancements and societal disruptions.	K3
CO5	To acquaint students with Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system.	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	-	-	-	-
CO3	-	-	2	-	-	3	3	1	3	-	-	-
CO4	-	-	2	-	-	3	3	2	3	-	-	1
CO5	-	-	2	-	-	3	3	2	3	-	-	2
Avg	-	-	2.00	3.00	-	3.00	3.00	1.80	3.00	-	-	1.67

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	1	-	2	-
CO2	1	-	-	-
CO3	-	1	-	-
CO4	1	-	2	-
CO5	-	1	2	-
Avg	1.00	1.00	2.00	-



EVALUATION SCHEME

B.TECH. ELECTRONICS ENGINEERING, ELECTRONICS & COMMUNICATION ENGINEERING, ELECTRONICS & TELECOMMUNICATION ENGINEERING

YEAR 4rd/ SEMESTER VII

Sr. No.	Sub Code	Subject Name	Dept.	L-T-P	Th/Lab Marks	Sessional		Subject Total	Credit
					ESE	CT	TA		
1		Open Elective-I**	Other Dept.	3--0--0	70	20	10	100	3
2		Departmental Elective-III	Core Deptt.	3--0--0	70	20	10	100	3
3		Departmental Elective-IV	Core Deptt.	3--1--0	70	20	10	100	4
4	REC701	Data Communication Networks	Core Deptt.	3--1--0	70	20	10	100	4
5	REC702	VLSI Design	Core Deptt.	3--0--0	70	20	10	100	3
6	REC751	Optical Communication Lab	Core Deptt.	0--0--2	50	-	50	100	1
7	REC752	Electronics Circuit Design Lab	Core Deptt.	0--0--2	50	-	50	100	1
8	REC753	Industrial Training Viva-Voce	Core Deptt.	0--0--3	-	-	100	100	2
9	REC754	Project-I	Core Deptt.	0--0--6	-	-	200	200	3
	TOTAL				450	100	450	1000	24

LIST OF DEPTT. ELECTIVES:

Elective – III REC 07* Departmental Elective III

1. REC070 Optical Network
2. REC071 Information Theory & Coding
3. REC072 Digital Image Processing
4. REC073 Advance Programming in Engineering

Elective – IV REC 07* Departmental Elective IV

1. REC075 Optical Communication
2. REC076 Filter Design
3. REC077 Applied Fuzzy Electronic Systems
4. REC078 Computerized Process Control



IMS Engineering College, Ghaziabad

Sub Code	ROE 074
Sub. Name	Understanding the Human Being Comprehensively -Human Aspirations and its Fulfilment

COURSE OUTCOMES		Bloom's Level
CO1	The methodology of this course is explorational and thus universally adaptable. It involves a systematic and rational study of the human being vis-à-vis the rest of existence.	
CO2	It is free from any dogma or set of do's and don'ts related to values.	
CO3	It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated and encouraged to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation.	
CO4	This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and then to continue within the student leading to continuous self-evolution.	
CO5	This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	1	2	3	2	2	1	-	3
CO2	-	-	1	-	1	-	2	3	1	-	-	2
CO3	-	1	-	-	2	2	2	3	2	1	-	2
CO4	1	-	-	-	2	-	2	2	2	1	1	1
CO5	-	-	1	2	-	2	2	2	2	1	-	2
Avg	1.00	1.00	1.00	2.00	1.50	2.00	2.20	2.40	1.80	1.00	1.00	2.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	1
CO2	-	-	1	-
CO3	-	-	1	2
CO4	-	-	1	1
CO5	-	-	1	-
Avg	-	-	1.20	1.33



IMS Engineering College, Ghaziabad

Sub Code	REC072
Sub. Name	DIGITAL IMAGE PROCESSING

COURSE OUTCOMES		Bloom's Level
CO1	Understand the need for image transforms and their properties	
CO2	Choose appropriate technique for image enhancement both in spatial and frequency Domains.	
CO3	Identify causes for image degradation and apply restoration techniques.	
CO4	Compare the image compression techniques in spatial and frequency domains.	
CO5	Select feature extraction techniques for image analysis and recognition.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	1	-	-	-	3	2	3
CO2	3	3	3	3	3	1	-	-	-	3	2	3
CO3	3	3	3	2	2	2	-	-	-	3	1	3
CO4	3	2	2	2	2	2	-	-	-	2	1	3
CO5	3	3	3	3	2	2	-	-	-	2	1	3
Avg	3	2.8	2.8	2.6	2.2	1.6	-	-	-	2.6	1.4	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3
CO2	3	2	1	2
CO3	3	3	1	3
CO4	2	2	1	2
CO5	3	2	2	2
Avg	2.8	2.4	1.4	2.4



IMS Engineering College, Ghaziabad

Sub Code	REC 075
Sub. Name	Optical Communication

COURSE OUTCOMES		Bloom's Level
CO1	Familiarize with basic concepts and theory of Optical Communication	
CO2	Demonstrate OPCOMM components, assemble them and solve problems on Optical Communication system	
CO3	Able to design, implements, analyse and maintains optical communication system	
CO4	Gain knowledge of different source of light as well as receiver and their comparative study	
CO5	To get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	-	-	1	2
CO2	3	3	3	2	2	1	1	-	-	-	1	3
CO3	3	3	3	3	2	1	1	1	2	2	1	3
CO4	3	3	3	1	1	1	1	-	-	-	-	3
CO5	3	3	3	3	2	1	1	1	1	1	1	3
Avg	3.00	3.00	2.60	2.00	1.75	1.00	1.00	1.00	1.50	1.50	1.00	2.80

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	1	-	1
CO2	3	2	2	3
CO3	3	3	3	3
CO4	2	2	1	1
CO5	3	3	3	2
Avg	2.80	2.20	2.25	2.00



IMS Engineering College, Ghaziabad

Sub Code	REC-701
Sub. Name	Data Communication Networks

COURSE OUTCOMES		Bloom's Level
CO1	Identify the issues and challenges in the architecture of a network	
CO2	Understand the ISO/OSI seven layers in a network	
CO3	Realize protocols at different layers of a network hierarchy	
CO4	Recognize security issues in a network	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	-	-	-	3
CO2	3	3	1	1	-	-	-	-	-	-	-	3
CO3	3	3	1	1	-	-	-	-	-	-	-	3
CO4	3	3	1	1	-	-	-	-	-	-	-	3
Avg	3	3	1	1	-	-	-	-	-	-	-	3

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	3	3	-	3
CO4	3	3	-	3
Avg	3	3	-	3



IMS Engineering College, Ghaziabad

Sub Code	REC 702
Sub. Name	VLSI Design

COURSE OUTCOMES		Bloom's Level
CO1	Model the behavior of a MOS Transistor	
CO2	Design combinational and sequential circuits using CMOS gates	
CO3	Identify the sources of power dissipation in a CMOS circuit.	
CO4	Analyze SRAM cell and memory arrays	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	3	-	-	-	-	-	2	3
CO2	3	3	2	3	3	-	-	-	-	-	2	3
CO3	3	3	2	3	3	-	-	-	-	-	2	2
CO4	3	3	2	3	3	-	-	-	-	-	1	2
Avg	3.00	3.00	2.00	3.00	3.00	-	-	-	-	-	1.75	2.50

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	3
CO2	3	3	-	3
CO3	3	3	-	2
CO4	3	3	-	2
Avg	3.00	3.00	-	2.50



IMS Engineering College, Ghaziabad

Sub Code	REC-751
Sub. Name	OPTICAL COMMUNICATION LAB

COURSE OUTCOMES		Bloom's Level
CO1	Students should be able to describe components, commands, web servers, LANs for analog link and digital link of optical fiber.	
CO2	Students should be able to design, implements, analyse losses and maintains optical communication system	
CO3	Students should be able to evaluate numerical aperture and various types of losses of an optical fiber, along with efficiency of different optical sources.	
CO4	Students should be able to implement different multiplexing technique.	
CO5	Students should be able to Gain knowledge of different coding and interference in optical communication	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	3	-	1	-	2	-	1	2
CO2	3	3	3	3	3	-	2	-	3	3	3	3
CO3	3	3	3	3	3	-	-	-	2	2	1	3
CO4	3	3	3	3	3	-	-	-	3	3	3	3
CO5	3	3	3	3	3	-	-	-	3	2	2	3
Avg	3	3	2.8	3	3	-	1.5	-	2.6	2.5	2	2.8

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	3
CO2	3	3	2	3
CO3	3	3	1	3
CO4	3	3	1	3
CO5	3	3	1	3
Avg	3	2.8	1.2	3



IMS Engineering College, Ghaziabad

Sub Code	REC 752
Sub. Name	Electronic Circuit Design Lab

COURSE OUTCOMES		Bloom's Level
CO1	Understand Universal op-amp based biquad.	
CO2	Identify amplitude control or stabilization applied to any sinusoidal oscillators and Op-amp/ OTA based function generator.	
CO3	Design log/antilog circuits and identify applications of analog multiplier/divider.	
CO4	Understand digital system design and its hardware implementation using TTL/CMOS ICs and any circuit idea (not studied in the course) using 555 Timer in conjunction with any other ICs.	
CO5	Design the circuit, make hardware and measure various parameters and Simulation in Spice of the designed circuit.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	-	-	-	3	2	3	3
CO2	3	3	3	3	3	-	-	-	3	2	3	3
CO3	3	3	3	3	3	-	-	-	3	2	3	3
CO4	3	3	3	3	3	-	-	-	3	2	3	3
CO5	3	3	3	3	3	-	-	-	3	3	3	3
Avg	3.00	3.00	3.00	3.00	3.00	-	-	-	3.00	2.20	3.00	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	3	1	3
CO2	3	3	1	3
CO3	3	3	1	3
CO4	3	2	1	3
CO5	3	3	1	3
Avg	3.00	2.80	1.00	3.00



IMS Engineering College, Ghaziabad

EVALUATION SCHEME

B.Tech. Electronics Engineering, Electronics & Communication Engineering, Electronics & Telecommunication Engineering

YEAR 4th/ SEMESTER VIII

Sr. No	Sub Code	Subject Name	Dept.	L-T-P	Th/LAB Marks	Sessional		Subject Total	Credit
					ESE	CT	TA		
1		Open Elective-II**	Other Dept.	3-0-0	70	20	10	100	3
2		Departmental Elective-V	Core Deptt.	3-1-0	70	20	10	100	4
3		Departmental Elective-VI	Core Deptt.	3-0-0	70	20	10	100	3
4	REC851	GD & Seminar	Core Deptt.	0-0-3			100	100	2
5	REC852	Project	Core Deptt.	0-0-12	350	-	250	600	12
	TOTAL				560	60	380	1000	24

LIST OF DEPTT. ELECTIVES:

Elective – IV REC 08* Departmental Elective V

1. REC080 Electronic Switching
2. REC081 Analytical Instrumentation
3. REC082 Advanced Display Technologies & Systems
4. REC083 Satellite & RADAR systems (NPTEL: <https://nptel.ac.in/courses/117105131/>)

Elective – VI REC 08* Departmental Elective VI

1. REC085 Wireless & Mobile Communication (NPTEL: <https://nptel.ac.in/courses/117102062/>)
2. REC086 Voice Over IP
3. REC087 Speech Processing
4. REC088 Micro and Smart Systems (NPTEL: <https://nptel.ac.in/courses/112108092/>)



IMS Engineering College, Ghaziabad

Sub Code	ROE 082
Sub. Name	Entrepreneurship Development

COURSE OUTCOMES		Bloom's Level
CO1	Develop idea generation, creative and innovative skills.	
CO2	Aware of different opportunities and successful growth stories	
CO3	Learn how to start an enterprise and design business plans those are suitable for funding by considering all dimensions of business.	
CO4	Understand entrepreneurial process by way of studying different case studies and find exceptions to the process model of entrepreneurship.	
CO5	Run a small enterprise with small capital for a short period and experience the science and art of doing business.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	2	2	1	2	2	1	1	2	2
CO2	-	1	-	-	1	1	2	2	2	2	3	2
CO3	-	1	2	1	2	2	2	1	3	2	3	3
CO4	1	2	-	2	-	1	2	-	2	1	2	1
CO5	1	2	2	1	1	1	2	3	3	2	2	2
Avg	1.00	1.40	1.67	1.50	1.50	1.20	2.00	2.00	2.20	1.60	2.40	2.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	1	1	3	2
CO2	1	1	3	2
CO3	1	1	3	2
CO4	1	1	3	2
CO5	1	1	3	2
Avg	1.00	1.00	3.00	2.00



IMS Engineering College, Ghaziabad

Sub Code	REC080
Sub. Name	ELECTRONIC SWITCHING

COURSE OUTCOMES		Bloom's Level
CO1	Describe and apply fundamentals of telecommunication systems and associated technologies.	
CO2	Solve problems and design simple systems related to tele-traffic and trunking efficiency.	
CO3	Understand and explain the reasons for switching, and the relative merits of the possible switching modes, e.g. packet and circuit switching.	
CO4	Understand the principles of the internal design and operation of telecommunication switches, and the essence of the key signalling systems that are used in telecommunication networks.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	-	-	-	-	-	-	3
CO2	3	3	3	2	2	-	-	-	-	-	-	3
CO3	3	3	3	3	2	-	-	-	-	-	-	3
CO4	3	3	3	2	2	-	-	-	-	-	-	3
Avg	3.00	3.00	2.75	2.00	1.75	-	-	-	-	-	-	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	1
CO3	3	3	1	1
CO4	3	2	1	1
Avg	3.00	2.50	1.00	1.00



IMS Engineering College, Ghaziabad

Sub Code	REC085
Sub. Name	WIRELESS & MOBILE COMMUNICATION

COURSE OUTCOMES		Bloom's Level
CO1	Familiarize with various generations of mobile communications.	
CO2	Understand the concept of cellular communication.	
CO3	Understand the basics of wireless communication.	
CO4	Understand GSM mobile communication standard, its architecture, logical channels, advantages and limitations.	
CO5	Gain knowledge of IS-95 CDMA mobile communication standard, its architecture, logical channels, advantages and limitations.	
CO6	Gain knowledge of 3G mobile standards and their comparison with 2G technologies.	

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	-	-	-	-	-	-	3
CO2	3	3	3	2	2	-	-	-	-	-	-	3
CO3	3	3	3	3	2	-	-	-	-	-	-	3
CO4	3	3	3	2	2	-	-	-	-	-	-	3
CO5	3	3	3	3	2	-	-	-	-	-	-	3
CO6	3	3	3	2	2	-	-	-	-	-	-	3
Avg	3.00	3.00	2.83	2.16	1.83	-	-	-	-	-	-	3.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	3	1	1
CO3	3	3	1	1
CO4	3	2	1	1
CO5	3	1	1	1
CO6	3	1	1	1
Avg	3.00	2.20	1.00	1.00