Department of Electrical & Electronics Engineering

2020-21

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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

Vision of Electrical and Electronics Engineering Department is to produce a dynamic, creative, technically sound and globally competitive engineer that can face the challenges of modern industry and serve the society at a global level.

Mission

- To provide the students globally accepted technical education in electrical and electronics engineering for making them technically skilled and motivated professionals in order to comply the needs of Society and modern Industries.
- To provide research oriented atmosphere among the students so that they imply their thoughts and knowledge in implementing live industrial projects.
- Emphasis on creation of excellence in applications through knowledge sharing, value addition programmes, beyond syllabus programmes, industry-academia interaction, interdisciplinary research and personality development programmes.
- To encourage faculties and students for higher studies and research for knowledge enhancement and hence become successful professionals in the society.

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

1. To produce proficient electrical and electronics engineering graduates with a strong foundation in design analytics and problem solving skills for successful professional careers in industry, research and public service.
2. To prepare the students to excel for self and societal development through higher studies and research activities.
3. To inculcate in students excellent professionalism, ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach and an ability to relate engineering issues to broader social context.
4. To provide students with an academic environment aware of excellence and the life-long learning needed for a successful professional career as an engineer, scientist, technocrat, administrator and an entrepreneur.
5. To train students with advance technical skills so as to comprehend, analyze, design and create innovative products and solutions for the real life problems.

Program Specific Outcomes (PSO)

1. Graduates shall have an ability to apply fundamental knowledge of mathematics, applied science, engineering and management for the solution of electrical engineering problems.
2. Graduates will be able to analyse and conduct investigations on complex engineering activities to arrive at valid conclusions.
3. Graduates shall have an ability to apply learned principles to the design, analysis, development and implementation of advanced electrical systems.

Evaluation Scheme B.Tech 2nd Year (Electrical & Electronics Engineering)

SEMESTER- III													
Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KOE031-38/ KAS302	Engg. Science Course/Maths IV	3	1	0	30	20	50		100		150	4
2	KAS301/ KVE301	Technical Communication/ Universal Human values	2 3	1 0	0 0	30	20	50		100		150	3
3	KEE301	Electromagnetic Field Theory	3	1	0	30	20	50		100		150	4
4	KEE302	Electrical Measurements & Instrumentation	3	1	0	30	20	50		100		150	4
5	KEE303	Basic Signals & Systems	3	0	0	30	20	50		100		150	3
6	KEE351	Analog Electronics Lab	0	0	2				25		25	50	1
7	KEE352	Electrical Measurements and Instrumentation Lab	0	0	2				25		25	50	1
8	KEE353	Electrical Workshop	0	0	2				25		25	50	1
9	KEE354	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	**Mathematics- IV**

COURSE OUTCOMES	
CO1	The idea of partial differentiation and types of partial differential equations
CO2	The idea of classification of second partial differential equations, wave , heat equation and transmission lines
CO3	The basic ideas of statistics including measures of central tendency, correlation, regression and their properties.
CO4	The idea s of probability and random variables and various discrete and continuous probability distributions and their properties.
CO5	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	2	2	1	1	2	3				1	1	2
CO2	1	1	2		2	3	2	2				
CO3		1	2	1	2	3	2		2	1	1	
CO4	1		1	1	1		2	2				
CO5	1	2	1		1		3	3		1	1	2
Avg	**1**	**1.20**	**1.40**	**1**	**1.80**	**3**	**2.2**	**2.2**	**2**	**1**	**1**	**2**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1
CO2	2	2	1
CO3	2	1	2
CO4	1	1	1
CO5	1	1	2
Avg	**2**	**1.5**	**1.40**

IMS Engineering College, Ghaziabad

Sub Code	**KAS-301**
Sub. Name	**Technical Communication**

COURSE OUTCOMES	
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 of 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 efficacy 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		3						2
CO2	1					3	2	2				
CO3				1		3	2		2			
CO4	1			1			2	2				
CO5							3	3				2
Avg	**1**	**0**	**0**	**1**	**0**	**3**	**2.2**	**2.2**	**2**	**0**	**0**	**2**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	2	1	
CO2	2	2	1	
CO3	2	1	1	
CO4	1	1	1	
CO5	1	1	1	
Avg	**2**	**1.5**	**1**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-301**
Sub. Name	**Electromagnetic Field Theory**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply different coordinate systems and their application in electromagnetic field theory, establish a relation between any two systems and also understand the vector calculus.	K_3
CO2	Understand the concept of static electric field. Understand the concept of current and properties of conductors. Establish boundary conditions and to calculate capacitances of different types of capacitors	K_4
CO3	Understand the concept of static magnetic field, magnetic scalar and vector potential	K_4
CO4	Understand the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors.	K_4
CO5	Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.	K_3

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
CO2	3	3	3	2	2							2
CO3	3	3	3	2	2							2
CO4	3	3	3	3	2							1
CO5	3	3	3	2	3				2	1		3
Avg	3.00	3.00	3.00	2.40	2.20	1.00			2.00	1.00		2.20

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	3	2	
CO2	3	3	2	
CO3	3	2	1	
CO4	3	3	2	
CO5	3	2	1	
Avg	3.00	2.60	1.60	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-302**
Sub. Name	**ELECTRICAL MEASUREMENTS & INSTRUMENTATION**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Evaluate errors in measurement as well as identify and use different types of instruments for the measurement of voltage, current, power and energy.	K1
CO2	Display the knowledge of measurement of electrical quantities resistance, inductance and capacitance with the help of bridges.	K2
CO3	Demonstrate the working of instrument transformers as well as calculate the errors in current and potential transformers.	K2
CO4	Manifest the working of electronic instruments like voltmeter, multi-meter, frequency meter and CRO.	K3
CO5	Display the knowledge of transducers, their classifications and their applications for the measurement of physical quantities like motion, force, pressure, temperature, flow and liquid level.	K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	2	2								2
CO2	2	1	1									2
CO3	1	1	1									1
CO4	1	1	2		2	2	2			1	1	2
CO5	2	2	2	2	2	2	2			2	2	3
Avg	**1.60**	**1.40**	**1.60**	**2.00**	**2.00**	**2.00**	**2.00**			**1.50**	**1.50**	**2.00**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	1	1	
CO2	3		1	
CO3	1	1	1	
CO4	2	2	2	
CO5	2	2	3	
Avg	**2.20**	**1.50**	**1.60**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-303**
Sub. Name	**Basic Signals and Systems**

COURSE OUTCOMES		**Bloom's Level**
CO1	Represent the various types of signals & systems and can perform mathematical operations on them.	
CO2	Analyze the response of LTI system to Fourier series and Fourier transform and to evaluate their applications to network analysis.	
CO3	Analyze the properties of continuous time signals and system using Laplace transform and determine the response of linear system to known inputs.	
CO4	Implement the concepts of Z transform to solve complex engineering problems using difference equations	
CO5	Develop and analyze the concept of state-space models for SISO & MIMO system.	

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	1	1								1
CO2	2	2	1	2								3
CO3	2	2	1	2								3
CO4	2	2	1	2								3
CO5	2	3	2	2	1							3
Avg	2.00	2.00	1.20	1.80	1.00							2.60

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	1	1	
CO2	3	2	2	
CO3	3	2	2	
CO4	3	2	2	
CO5	3	2	2	
Avg	3.00	1.80	1.80	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-351**
Sub. Name	**Analog Electronics Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the characteristics and applications of the Semiconductor devices.	K_2, K_3
CO2	Draw the characteristics of BJT, FET and MOSFET.	K_2, K_4
CO3	Understand the parameters of Operational Amplifier and instrumentation. Amplifier with their applications.	K_2, K_4
CO4	Understand the V-I characteristics of Power devices like SCR, TRIAC.	K_2, K_4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	1	2	1				1		2
CO2	3	2	3	1	2	1				1		2
CO3	3	3	3	1	2	1				2		3
CO4	3	3	2		2	2				2		
Avg	3.00	2.75	2.75	1.00	2.00	1.25				1.50		2.33

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	2	1	
CO2	3	2	2	
CO3	3	3	1	
CO4	3	2	1	
Avg	3.00	2.25	1.25	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-352**
Sub. Name	**ELECTRICAL MEASUREMENTS AND INSTRUMENTATION LAB**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Understand the importance of calibration of measuring instruments.	K1
CO2	Demonstrate the construction and working of different measuring instruments.	K3
CO3	Demonstrate the construction and working of different AC and DC bridges, along with their applications.	K2
CO4	Ability to measure electrical engineering parameters like voltage, current, power & phase difference in industry as well as in power generation, transmission and distribution sectors.	K2

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	1		2		1		2			2
CO2	2		2	1	2	2	2		2			2
CO3	3	1	2	1	2				2	2		2
CO4	2	2	1	1		2	2		2		2	2
Avg	**2.25**	**1.33**	**1.50**	**1.00**	**2.00**	**2.00**	**1.67**		**2.00**	**2.00**	**2.00**	**2.00**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2		2	
CO2	2	2	2	
CO3	2		2	
CO4	2	2	2	
Avg	**2.00**	**2.00**	**2.00**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-353**
Sub. Name	**Electrical Workshop**

COURSE OUTCOMES		**Bloom's Level**
CO1	Perform various types of Electrical connections.	K_3
CO2	Develop small circuits on PCB	K_6
CO3	Differentiate between various electrical wires, cables and accessories.	K_3
CO4	Demonstrate the layout of electrical substation & various safety measures.	K_2
CO5		

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	2	2				1	2		
CO2	3	2	3	1	2				1	2		2
CO3	3	3	3	2	2	1	1		1	2		2
CO4	3	3	3	2	2	1	1				1	2
CO5												
Avg	3.00	2.75	3.00	1.75	2.00	1.00	1.00		1.00	2.00	1.00	2.00

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	2	2	
CO2	3	3	2	
CO3	3	3	2	
CO4	3	2	2	
CO5				
Avg	3.00	2.50	2.00	

IMS Engineering College, Ghaziabad

Sub Code	KNC-301
Sub. Name	Computer System Security

COURSE OUTCOMES	
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				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**	**0**	**1**	**0**	**3**	**2.2**	**2.2**	**2**	**0**	**1**	**2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	2	1	
CO2	2	2	1	
CO3	2	1	2	
CO4	1	1	1	
CO5	1	1	2	
Avg	**2**	**1.5**	**1.40**	

Evaluation Scheme B.Tech 2nd Year (Electrical & Electronics Engineering)

SEMESTER IV													
Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			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	KEE401	Digital Electronics	3	0	0	30	20	50		100		150	3
4	KEE402	Electrical Machines-I	3	1	0	30	20	50		100		150	4
5	KEE403	Networks Analysis & Synthesis	3	1	0	30	20	50		100		150	4
6	KEE451	Circuit Simulation Lab	0	0	2				25		25	50	1
7	KEE452	Electrical Machines-I Lab	0	0	2				25		25	50	1
8	KEE453	Digital Electronics 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- 048**
Sub. Name	**Electronics Engineering**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Understand the concept of PN junction and special purpose diodes.	K2
CO2	Study the application of conventional diode and semiconductor diode.	K1
CO3	Analyse the I-V characteristics of BJT and FET.	K4
CO4	Analyze the Op-Amp, amplifiers, integrator, and differentiator.	K3
CO5	Understand the concept of digital storage oscilloscope and compare of DSO with analog oscilloscope	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	1	1	1				1			2
CO2	3	3	3	2	1		1	1	1		1	3
CO3	3	3	3	2	1		1	1	2	1	1	3
CO4	3	3	3	3	3	1	1	1	2	1	1	3
CO5	3	3	3	3	3	1	1	2	2	2	2	3
Avg	**3.00**	**3.00**	**2.60**	**2.20**	**1.80**	**1.00**	**1.00**	**1.25**	**1.60**	**1.33**	**1.25**	**2.80**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3		1	
CO2	3	1	2	
CO3	3		2	
CO4	3	1	2	
CO5	3	2	3	
Avg	**3.00**	**1.33**	**2.00**	

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	Distinguish 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	
CO1	2			
CO2	1	2		
CO3	1		2	
CO4	2		1	
CO5	1			
Avg	1.40	2.00	1.50	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-401**
Sub. Name	**Digital Electronics**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to apply concepts of Digital Binary System and Implementation of Gates.	K3
CO2	Students will be able to Analyze and Design the Combinational Logic Circuits.	K4
CO3	Students will be able to Analyze and Design the Sequential Logic Circuits with their applications.	K4
CO4	Students will be able to Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits.	K3
CO5	Students will be able to Apply the concept of Digital Logic Families with circuit implementation.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	1	1	1				1			2
CO2	3	3	3	2	1		1	1	1		1	3
CO3	3	3	3	2	1		1	1	2	1	1	3
CO4	3	3	3	3	3	1	1	1	2	1	1	3
CO5	3	3	3	3	3	1	1	2	2	2	2	3
Avg	**3.00**	**3.00**	**2.60**	**2.20**	**1.80**	**1.00**	**1.00**	**1.25**	**1.60**	**1.33**	**1.25**	**2.80**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3		1	
CO2	3	1	2	
CO3	3		2	
CO4	3	1	2	
CO5	3	2	3	
Avg	**3.00**	**1.33**	**2.00**	

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Sub Code	**KEE- 402**
Sub. Name	**Electrical Machine - I**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to analyze the various principles & concepts involved in Electromechanical Energy conversion.	K4
CO2	Students will be able to Demonstrate the constructional details of DC machines as well as transformers and principle of operation of brushless DC motor, Stepper and DC Servo motors.	K2
CO3	Students will be able to Evaluate the performance and characteristics of DC Machine as motor and as well as generator.	K4
CO4	Students will be able to Evaluate the performance of transformers, individually and in parallel operation.	K4
CO5	Students will be able to Demonstrate and perform various connections of three phase transformers.	K3

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	1	1	1	1				1	2
CO2	1	2	3	2	2	1						3
CO3	3	2	2	2	2	2	1					3
CO4	3	2	2	3	2	2	1					2
CO5	2	2	3	2	1	1	1					2
CO6												
Average	2.20	2.20	2.40	2.00	1.60	1.40	1.00				1.00	2.40

CO-PSO Matrix			
COs	PSO1	PSO2	PSO3
CO1	3	1	1
CO2	3	1	3
CO3	2	2	3
CO4	2	2	3
CO5	2	2	2
CO6			
Average	2.40	1.60	2.40

IMS Engineering College, Ghaziabad

Sub Code	**KEE-403**
Sub. Name	**Network Analysis & Synthesis**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply the knowledge of basic circuital law, nodal and mesh methods of circuit analysis and simplify the network using Graph Theory approach.	K_3
CO2	Analyze the AC and DC circuits using Kirchhoff's law and Network simplification theorems.	K_4
CO3	Analyze steady-state responses and transient response of DC and AC circuits using classical and Laplace transform methods.	K_4
CO4	Demonstrate the concept of complex frequency and analyze the structure and function of one and two port network. Also evaluate and analysis two-port network parameters.	K_4
CO5	Synthesize one port network and analyze different filters.	K_4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	1								1
CO2	2	2	2	2								2
CO3	2	3	2	2								3
CO4	3	3	3	3								3
CO5	3	3	3	3	1							3
Avg	2.40	2.60	2.20	2.20	1.00							2.40

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	1	1	
CO2	2	1	1	
CO3	3	1	2	
CO4	3	1	3	
CO5	3	1	2	
Avg	2.60	1.00	1.80	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-451**
Sub. Name	**Circuit Simulation Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply the knowledge of basic circuital law, nodal and mesh analysis for given circuit.	K2
CO2	Analysis of the AC and DC circuits using simulation techniques.	K3
CO3	Analysis of transient response of AC circuits.	K3
CO4	Evaluation and analysis of two-port network parameters.	K2
CO5	Estimation of parameters of different filters.	K2

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	1	1	2				2	1		1
CO2	2	2	1	2	2				2	1		2
CO3	2	2	1	2	2				2	1		3
CO4	3	2	3	2	1				2	1		3
CO5	2	2	2	2	1				2	1		3
Avg	2.20	2.00	1.60	1.80	1.60				2.00	1.00		2.40

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	1		
CO2	2	1	1	
CO3	2	2	1	
CO4	2	2		
CO5	2	2	1	
Avg	2.00	1.60	1.00	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-452**
Sub. Name	**ELECTRICAL MACHINES-I LAB**

COURSE OUTCOMES		**Bloom's Level**
CO1	Analyze and conduct basic tests on DC Machines and single-phase Transformer.	K2
CO2	Obtain the performance indices using standard analytical as well as graphical methods.	K3
CO3	Determine the magnetization, Load and speed-torque characteristics of DC Machines.	K3
CO4	Demonstrate procedures and analysis techniques to perform electromagnetic and electromechanical tests on electrical machines.	K2
CO5		

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2		2	2				2	1	2	2
CO2	2		2	2					2	1		2
CO3	2	2	2		2				2	1		2
CO4	2	2			2				2	1		2
CO5												
Avg	2.00	2.00	2.00	2.00	2.00				2.00	1.00	2.00	2.00

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	2	2	
CO2	2			
CO3	2		2	
CO4	2	2		
CO5				
Avg	2.00	2.00	2.00	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-453**
Sub. Name	**Digital Electronics Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understanding of Digital Binary System and implementation of Gates.	
CO2	Design the Sequential circuits with the help of combinational circuits and feedback element.	
CO3	Design data selector circuits with the help of universal Gates.	
CO4	Design the counters with the help of sequential circuit and basic Gates.	
CO5	Implement the projects using the digital ICs and electronics components.	

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1				2	1		3
CO2	3	3	3	2	1			1	3	2		3
CO3	3	3	3	2	2	1		1	3	2		3
CO4	3	3	3	3	3			1	3	2		3
CO5	3	3	3	3	3	1	1	2	3	2	2	3
Avg	**3.00**	**3.00**	**2.60**	**2.20**	**2.00**	**1.00**	**1.00**	**1.25**	**2.80**	**1.80**	**2.00**	**3.00**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3		2	
CO2	3	2	3	
CO3	3	2	3	
CO4	3	2	3	
CO5	3	3	3	
Avg	**3.00**	**2.25**	**2.80**	

IMS Engineering College, Ghaziabad

Sub Code	**KNC-402**
Sub. Name	PYTHON PROGRAMMING

COURSE OUTCOMES	
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**	**0**	**1**	**0**	**3**	**2.2**	**2.2**	**2**	**0**	**1**	**2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	2	1	
CO2	2	2	1	
CO3	2	1	2	
CO4	1	1	1	
CO5	1	1	2	
Avg	**2**	**1.5**	**1.40**	

EVALUATION SCHEME - B.TECH 3rd YEAR (ELECTRICAL & ELECTRONICS ENGINEERING)

SEMESTER V

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KEE501	Power System - I	3	1	0	30	20	50		100		150	4
2	KEE502	Control System	3	1	0	30	20	50		100		150	4
3	KEE503	Electrical Machines-II	3	1	0	30	20	50		100		150	4
4	KE*051-KE*054	Departmental Elective-I	3	0	0	30	20	50		100		150	3
5	KEE055-KEE058	Departmental Elective-II	3	0	0	30	20	50		100		150	3
6	KEE551	Power System-I Lab	0	0	2				25		25	50	1
7	KEE552	Control System Lab	0	0	2				25		25	50	1
8	KEE553	Electrical Machines - II Lab	0	0	2				25		25	50	1
9	KEN554	Mini Project or Internship Assessment*	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			
11		MOOCs (Essential for Hons. Degree)											
		Total	**17**	**3**	**8**							**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

KEE051 Robotics
KEE052 Sensors and Transducers
KEE053 Industrial Automation and Control
KEN051 Bio-Medical Instrumentation

DEPARTMENT ELECTIVE - II

KEE055 Optimization Techniques
KEE056 Neural Networks & Fuzzy System
KEE057 Digital Signal Processing
KEE058 Analog & Digital Communication

IMS Engineering College, Ghaziabad

Sub Code	KEE-501
Sub. Name	Power System-1

COURSE OUTCOMES		Bloom's Level
CO1	Describe the working principle and basic components of conventional power plants as well as the other aspects of power generation.	K2
CO2	Recognize elements of power system and their functions, as well as compare the different types of supply systems. Illustrate different types of conductors, transmission lines and various performance parameters of transmission line for short, medium and long transmission line.	K4
CO3	Calculate sag and tension in overhead lines with and without wind and ice loading. Classify different type of insulators, determine potential distribution over a string of insulator, string efficiency and its improvement.	K4
CO4	Compute the inductance and capacitance of single phase, three phase lines with symmetrical and unsymmetrical spacing, Composite conductors-transposition, bundled conductors, and understand the effect of earth on capacitance of transmission lines.	K4
CO5	Elucidate different types of cables and assess the Resistance and capacitance parameters of cables, grading of cables and compare overhead lines and cables.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		2	2	1		1		1		1	
CO2	2	2	2	3	1		1					
CO3	3	3	2	1	1	1						
CO4	2	2	2	2	1		1					
CO5	3		2	2	1		1		1		1	
Avg	2.60	2.33	2.00	2.00	1.00	1.00	1.00		1.00		1.00	

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	2	1	
CO2	2	2	1	
CO3	3	3	2	
CO4	3	2	2	
CO5	3	3	3	
Avg	2.80	2.40	1.80	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-502**
Sub. Name	**Control System**

COURSE OUTCOMES		**Bloom's Level**
CO1	Obtain transfer functions to predict the correct operation of open loop and closed loop control systems and identify the basic elements, structures and the characteristics of feedback control systems.	**K3**
CO2	Measure and evaluate the performance of basic control systems in time domain. Design specification for different control action.	**K4**
CO3	Analyze the stability of linear time-invariant systems in time domain using Routh Hurwitz criterion and root locus technique.	**K4**
CO4	Determine the stability of linear time-invariant systems in frequency domain using Nyquist criterion and Bode plot.	**K4**
CO5	Design different type of compensators to achieve the desired performance of control System by root locus and Bode plot method. Develop and analyze the intermediate states of the system using state space analysis.	**K5**

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	1	1								1
CO2	3	2	2	1								2
CO3	2	2	3	2								3
CO4	3	2	2	3								3
CO5	3	3	3	3	1							3
Avg	2.60	2.00	2.20	2.00	1.00							2.40

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	1	2	1	
CO2	2	2	2	
CO3	3	2	2	
CO4	3	2	2	
CO5	3	2	2	
Avg	2.40	2.00	1.80	

IMS Engineering College, Ghaziabad

Sub Code	**KEE- 503**
Sub. Name	**Electrical Machine - II**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to Demonstrate the constructional details and principle of operation of three phase Induction and Synchronous Machines.	K3
CO2	Students will be able to Analyze the performance of the three phase Induction and Synchronous Machines using the phasor diagrams and equivalent circuits. .	K4
CO3	Students will be able to Select appropriate three phase AC machine for any application and appraise its significance.	K4
CO4	Students will be able to Start and observe the various characteristics of three phase Induction & Synchronous Machines	K4
CO5	Students will be able to Explain the principle of operation and performance of Single-Phase Induction Motor & Universal Motor.	K3

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		2	2	1		1		1		1	
CO2	2	2	2	3	1		1					
CO3	3	3	2	1	1	1						
CO4	2	2	2	2	1		1					
CO5	3		2	2	1		1		1		1	
CO6												
Average	2.60	2.33	2.00	2.00	1.00	1.00	1.00		1.00		1.00	

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	
CO1	3	2	1	
CO2	2	2	1	
CO3	3	3	2	
CO4	3	2	2	
CO5	3	3	3	
CO6				
Average	2.80	2.40	1.80	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-052**
Sub. Name	**Sensors and Transducers**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Understand the working of commonly used sensors in industry for measurement of displacement, force and pressure.	
CO2	Recognize the working of commonly used sensors in industry for measurement of temperature, position, accelerometer, vibration sensor, flow and level.	
CO3	Identify the application of machine vision.	
CO4	Conceptualize signal conditioning and data acquisition methods.	
CO5	Comprehend smart sensors and their applications in automation systems.	

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	2	1	2	2	2				1	2
CO2	2	1	2	1	2	2	2				1	2
CO3	2	1	2	2	3	2	1			1	1	2
CO4	1	1	1	2	3	1	1					2
CO5	2	2	1	2	3	1				1	1	2
Avg	**1.80**	**1.20**	**1.60**	**1.60**	**2.60**	**1.60**	**1.50**			**1.00**	**1.00**	**2.00**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	1	3	
CO2	2	1	3	
CO3	1	1	2	
CO4	2	2	2	
CO5	2	2	3	
Avg	**1.80**	**1.40**	**2.60**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-058**
Sub. Name	**Analog & Digital Communication**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Understand the Amplitude Modulation in communication system.	K3
CO2	Comprehend the Frequency & Phase modulation.	K2
CO3	Realize the Pulse Modulation Techniques	K2
CO4	Get the Digital Modulation Techniques and their use in communication system.	K2
CO5	Apply the concept of Information Theory in Communication Engineering.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1							1
CO2	2	3	2	2	1	1	1		1	1		2
CO3	3	2	3	2	2	1	1	1			1	3
CO4	2	3	2	1	1	2	1		1	1		2
CO5	2	2	1	2	1	2	1	1			1	
Avg	2.25	2.25	2.00	1.50	1.25	1.33	1.00	1.00	1.00	1.00	1.00	2.00

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3		1	
CO2	3	1	2	
CO3	3		2	
CO4	3	1	2	
CO5	3	2	3	
Avg	**3.00**	**1.33**	**2.00**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-551**
Sub. Name	**POWER SYSTEM-I LAB**

COURSE OUTCOMES		**Bloom's Level**
CO1	Use programming tools /Software: Scilab, MATLAB or any C, C++ - Compiler and formulate a program/simulation model for calculation of various parameters related to transmission line.	**K6**
CO2	Use programming tools /Software: Scilab, MATLAB or any C, C++ - Compiler and formulate a program/simulation model for calculation of parameters for underground cable.	**K6**
CO3	Use programming tools /Software: Scilab, MATLAB or any C, C++ - Compiler and formulate a program/simulation model for calculation of corona loss.	**K6**

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3		2	2	1		1		1		1	
CO2	2	2	2	3	1		1					
CO3	3	3	2	1	1	1						
Avg	2.67	2.50	2.00	2.00	1.00	1.00	1.00		1.00		1.00	

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3	2	1	
CO2	2	2	1	
CO3	3	3	2	
Avg	3.00	1.80	1.80	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-552**
Sub. Name	**Control System Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Determine the characteristics of control system components like ac servo motor, synchro, potentiometer, servo voltage stabilizer and use them in error detector mode.	**K3**
CO2	Compare the performance of control systems by applying different controllers /compensators.	**K4**
CO3	Analyze the behavior of dc motor in open loop and closed loop conditions at various loads & determine the response of 1st& 2nd order systems for various values of constant K.	**K4**
CO4	Apply different stability methods of time & frequency domain in control systems using software & examine their stability.	**K4**
CO5	Convert the transfer function into state space & vice versa & obtain the time domain response of a second order system for step input and their performance parameters using software.	**K5**

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	1	1	1				2	1		1
CO2	3	3	2	1	1				2	1		2
CO3	2	2	2	1	2				2	1		3
CO4	3	2	3	1	3				2	1		3
CO5	2	2	2	1	3				2	1		3
Avg	2.40	2.00	2.00	1.00	2.00				2.00	1.00		2.40

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	2	1	
CO2	2	2	1	
CO3	2	2	2	
CO4	2	1	2	
CO5	2	1	2	
Avg	2.00	1.60	1.60	

IMS Engineering College, Ghaziabad

Sub Code	**KEE- 553**
Sub. Name	**Electrical Machine–II Lab**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to Perform various tests and demonstrate the various characteristics of three phase induction motor.	K4
CO2	Students will be able to Demonstrate the working of three phase synchronous machine under different operating conditions. .	K4
CO3	Students will be able to Evaluate the performance of single-phase induction motor under different operating conditions.	K5
CO4	Students will be able to Develop simulation models for Electrical Machines.	K6

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	2	1	2						2
CO2	3	1	2	1	1	1						2
CO3	2	2	2	2	1	1						2
CO4	2	3	3	2	3	2						2
CO5												
CO6												
Average	2.50	1.75	2.25	1.75	1.50	1.50						2.00

CO-PSO Matrix				
COs	PSO1	PSO2	PSO3	
CO1	2	2	1	
CO2	2	2	1	
CO3	1	2	2	
CO4	2	3	2	
CO5				
CO6				
Average	1.75	2.25	1.50	

IMS Engineering College, Ghaziabad

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

COURSE OUTCOMES	
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				2		3
CO4					2	2		2		2	2	
CO5					2	2		3	1	2		2
CO6												
Average					2.00	2.33		2.50	1.00	1.60	2.00	2.25

CO-PSO Matrix			
COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4	2	1	1
CO5			
CO6			
Average	2.00	1.00	1.00

Evaluation Scheme B.Tech 3rd Year (Electrical & Electronics Engg.)

SEMESTER VI												
Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KEE601	Power System-II	3	1	0	30	20	50		100		150	4
2	KEE602	Microprocessor and Microcontroller	3	1	0	30	20	50		100		150	4
3	KEE603	Power Electronics	3	1	0	30	20	50		100		150	4
4	KE*06*	Departmental Elective-III	3	0	0	30	20	50		100		150	3
5	KOE06*	Open Elective-I	3	0	0	30	20	50		100		150	3
6	KEE651	Power System-II Lab	0	0	2				25		25	50	1
7	KEE652	Microprocessor and Microcontroller Lab	0	0	2				25		25	50	1
8	KEE653	Power Electronics Lab	0	0	2				25		25	50	1
10	KNC601/ KNC602	Constitution of India, Law and Engineering / Indian Tradition, Culture and Society	2	0	0	15	10	25		50			
11		MOOCs (Essential for Hons. Degree)											
		Total	**17**	**3**	**6**							**900**	**21**

DEPARTMENT ELECTIVE - III

KEE 061 Special Electrical Machines
KEN 061 Linear Integrated Circuits
KEE 063 Digital Control System
KEN 062 Embedded Systems

IMS Engineering College, Ghaziabad

Sub Code	**KEE- 601**
Sub. Name	**Power System - II**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to Identify power system components on one line diagram of power system and its representation including the behaviour of the constituent components and subsystems and Analyse a network under both balanced and unbalanced fault conditions and design the rating of circuit breakers.	K4
CO2	Students will be able to Perform load flow analysis of an electrical power network and interpret the results of the analysis. .	K4
CO3	Students will be able to describe the concept of travelling waves in transmission lines and use the travelling wave theory to determine the over voltage caused by surge propagation in transmission networks.	K4
CO4	Students will be able to assess the steady state and transient stability of the power system under various conditions.	K4
CO5	Students will be able to Describe Operating Principle of a relay and classify them according to applications. Explain working principle of Circuit breaker and phenomenon of arc production and quenching.	K3

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	3	2	1	1				1	2
CO2	3	3	2	2	2						1	2
CO3	2	1	1	2	1	1						3
CO4	2	2	2	2	1		2				1	2
CO5	3	2	3	1	1	1						2
CO6												
Average	2.40	2.00	2.00	2.00	1.40	1.00	1.50				1.00	2.20

CO-PSO Matrix			
COs	PSO1	PSO2	PSO3
CO1	2	2	2
CO2	3	2	3
CO3	2	1	2
CO4	3	2	2
CO5	2	1	2
CO6			
Average	2.40	1.60	2.20

IMS Engineering College, Ghaziabad

Sub Code	**KEE-602**
Sub. Name	**Microprocessor & Microcontroller**

Course Outcomes:		**Knowledge Level, KL**
Upon the completion of the course, the student will be able to:		
CO 1	Demonstrate the basic architecture of 8085 & 8086 microprocessors	K1
CO2	Illustrate the programming model of microprocessors & write program using 8085 microprocessor	K3
CO3	Interface different external peripheral devices with 8085 microprocessor	K3
CO4	Comprehend the architecture of 8051 microcontroller	K2
CO5	Compare advance level microprocessor & microcontroller for different applications	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	1	1				1			2
CO2	3	2	3	2	1		1	1	1		1	3
CO3	2	3	3	2	1	1	1	1	2	1	1	1
CO4	3	2	3	3	3	1	1	1	2	1	1	3
CO5	2	3	3	3	3	1	1	2	2	2	2	2
Avg	**2.40**	**2.60**	**2.60**	**2.20**	**1.80**	**1.00**	**1.00**	**1.25**	**1.60**	**1.33**	**1.25**	**2.10**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3		1	
CO2	3	1	2	
CO3	3		2	
CO4	3	1	2	
CO5	3	2	3	
Avg	**3.00**	**1.33**	**2.00**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-603**
Sub. Name	**POWER ELECTRONICS**

COURSE OUTCOMES		**Bloom's Level**
CO1	Demonstrate the characteristics as well as the operation of BJT, MOSFET, IGBT, SCR, TRIAC and GTO and identify their use in the power switching applications.	**K4**
CO2	Comprehend the non-isolated DC-DC converters and apply their use in different Power electronics applications.	**K3**
CO3	Analyze the phase controlled rectifiers and evaluate their performance parameters.	**K5**
CO4	Apprehend the working of single-phase ac voltage controllers, cyclo-converters and their various applications.	**K3**
CO5	Explain the single-phase and three phase bridge inverters differentiate between CSI and VSI and apply PWM for harmonic reduction.	**K4**

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	1	1		1						2
CO2	2	2	2	2	1							2
CO3	3	3	3	1	2	1						3
CO4	2	2	2	1	1							2
CO5	3	2	3	1	2	1	1					2
Avg	2.40	2.00	2.20	1.20	1.50	1.00	1.00					2.20

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2		1	
CO2	2	1	3	
CO3	3	1	3	
CO4	2	1	2	
CO5	3	1	2	
Avg	**2.40**	**1.00**	**2.20**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-061**
Sub. Name	**SPECIAL ELECTRICAL MACHINES**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Describe the working principle, Constructional Features of different types of electrical machines including the fractional kilowatt machines.	K2
CO2	Analyse torque- speed characteristics of different electrical machines and interpret their performance and identify the suitable machine for an operation.	K4
CO3	Study different types of control techniques for a machine and identify the best control strategy based upon different constraints.	K4
CO4	Illustrate the use of stepper, BLDCs, SRM, and other special machines in the area of the various industrial and domestic as well as commercial applications of various fractional kilowatt machines.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	1	1	1				1		1	2
CO2	3	2	3	2	1		1	1	1		1	3
CO3	3	2	3	2	1		1	1	2	1	1	3
CO4	3	2	3	3	3		1	1	2	1	1	3
Avg	3.00	2.00	2.50	2.00	1.50	0.00	1.00	1.00	1.50	1.00	1.00	2.75

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	3		3	
CO2	3	1	3	
CO3	3		3	
CO4	3	1	3	
Avg	3.00	1.00	3.00	

IMS Engineering College, Ghaziabad

Sub Code	**KOE-069**
Sub. Name	Understanding the Human Being Comprehensively – Human Aspirations and its Fulfillment

COURSE OUTCOMES	
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**	**1**	**1**	**2**	**1.5**	**2**	**2.2**	**2.4**	**1.8**	**1**	**1**	**2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2		1	
CO2	1	1		
CO3	2	1		
CO4	1			
CO5	2	2		
Avg	1.6	1.33	1	

IMS Engineering College, Ghaziabad

Sub Code	**KEE- 651**
Sub. Name	**Power System–II Lab**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to Test various relays for different characteristics and compare with the performance characteristics provided by manufacturers.	K4
CO2	Students will be able to Select the power system data for load-flow and fault studies and to develop a program to solve power flow problem using NR and GS methods.	K6
CO3	Students will be able to Analyze various types of short circuit faults	K4
CO4	Students will be able to Demonstrate different numerical integration methods and factors influencing transient stability	K3
CO5	Students will be able to Determine the effect of load in long transmission line	K3

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	1	1						2
CO2	3	2	3	2	2							2
CO3	3	3	2	2	2	1					1	3
CO4	2	2	3	2	1							2
CO5	3	3	2	1	2	1	1				1	2
CO6												
Average	2.60	2.40	2.40	1.80	1.60	1.00	1.00				1.00	2.20

CO-PSO Matrix			
COs	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	2	2	3
CO3	3	2	3
CO4	2	1	2
CO5	3	1	2
CO6			
Average	2.40	1.60	2.20

IMS Engineering College, Ghaziabad

Sub Code	**KEE-652**
Sub. Name	**Microprocessor & Microcontroller Lab**

Course Outcomes:		**Knowledge Level, KL**
Upon the completion of the course, the student will be able to:		
CO 1	Study of microprocessor system	K2
CO2	Development of flow chart for understanding the data flow	K3
CO3	Learning assembly language to program microprocessor based system	K3
CO4	Interfacing different peripheral devices with the microprocessor	K4
CO5	Building logic for microprocessor based system	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	1				1			2
CO2	2	1	3	2	1		1	1	1		1	3
CO3	3	2	3	2	1		2	1	2	1	1	2
CO4	3	2	3	3	3	1	1	1	2	1	1	3
CO5	3	3	3	3	3	1	2	2	2	2	2	2
Avg	**2.80**	**2.40**	**2.60**	**2.20**	**1.80**	**1.00**	**1.20**	**1.25**	**1.60**	**1.33**	**1.25**	**2.40**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3		1	
CO2	3	2	2	
CO3	2	1	3	
CO4	3	1	1	
CO5	2	2	3	
Avg	**2.60**	**1.20**	**2.00**	

IMS Engineering College, Ghaziabad

Sub Code	**KEE-653**
Sub. Name	**Power Electronics Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Analyze the characteristics of MOSFET, IGBT, SCR and SCR.	**K4**
CO2	Design firing circuits for Thyristors	**K3**
CO3	Construct power semiconductor circuits for industrial applications	**K5**
CO4	Analyze the operation of motors on various power converters.	**K3**
CO5	Analyze the working of various converters through MATLAB simulation.	**K4**

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	2	2						2
CO2	2	2	3	1	1	1						2
CO3	3	1	2	2	2	1	2					2
CO4	3	2	2	1	2	1						1
CO5	2	2	2	2	1	1						2
Avg	2.40	1.80	2.00	1.60	1.60	1.20	2.00					1.80

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	1	1	
CO2	2	2	2	
CO3	1	2	1	
CO4	2	2	2	
CO5	2	2	2	
Avg	1.80	1.80	1.60	

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	
CO1	1		2	
CO2	1			
CO3		1		
CO4	1		2	
CO5		1	2	
Avg	1.00	1.00	2.00	

Evaluation Scheme B.Tech 4th Year (Electrical & Electronics Engg.)

YEAR 4th / SEMESTER-VII

S. No.	Subject Code	Subject Name	Department	L-T-P	Th./Lab Marks	Sessional		Total	Credit
					ESE	CT	TA		
1		OPEN ELECTIVE COURSE-1	Other Deptt.	3--0--0	70	20	10	100	3
2		DEPTT ELECTIVE COURSE-3	Core Deptt.	3--0--0	70	20	10	100	3
3		DEPTT ELECTIVE COURSE-4	Core Deptt.	3--1--0	70	20	10	100	4
4	REN701	COMMUNICATION SYSTEMS	Core Deptt.	3--1--0	70	20	10	100	4
5	REE702	POWER SYSTEM PROTECTION	Core Deptt.	3--0--0	70	20	10	100	3
6	REE751	INDUSTRIAL AUTOMATION & PLC LAB	Core Deptt.	0--0--2	50		50	100	1
7	REE752	POWER SYSTEM LAB	Core Deptt.	0--0--2	50		50	100	1
8	REN753	INDUSTRIAL TRAINING	Core Deptt.	0--0--3			100	100	2
9	REN754	PROJECT-1	Core Deptt.	0--0--6			200	200	3
	TOTAL				**450**	**100**	**450**	**1000**	**24**

DEPTT. ELECTIVE COURSE-3

1. REE070: Microprocessors and Microcontrollers
2. REE071: Utilization of Electrical Energy & Electric Traction
3. REE072: Introduction to Smart Grid
4. REN070: Introduction to Robotics

DEPTT. ELECTIVE COURSE-4

1. REE075: Industrial Automation and Control
2. REE076: Energy Efficiency & Conservation
3. REE077: Reliability Engineering
4. REN075: Telemetry & Data Transmission

IMS Engineering College, Ghaziabad

Sub Code	**ROE-074**
Sub. Name	**Understanding the Human Being**

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	
CO1	2		1	
CO2	1	1		
CO3	2	1		
CO4	1			
CO5	2	2		
Avg	1.60	1.33	1.00	

IMS Engineering College, Ghaziabad

Sub Code	**REE071**
Sub. Name	**Utilization of Electrical Energy and Traction**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	To understand the operating principles and characteristics of traction motors with respect to speed, temperature, loading condition	K3
CO2	To acquaint with the different types of heating and welding techniques	K4
CO3	To study the basic principles of illumination and its measurement	K4
CO4	To understand the basic principle of electric traction including speed– time curves of different traction services	K3
CO5	To understand the method of calculation of various traction system for braking, acceleration and other related parameters, including demand side management.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1	1		1						
CO2	2	1	1	1		1						
CO3	2	1	2	1		1						
CO4	2	2	1	1	1	1						
CO5	3	2	2	2	2	2						
Avg	2.25	1.50	1.40	1.20	1.50	1.20						

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	1	1	
CO2	2	2	1	
CO3	1	2	1	
CO4	1	2	1	
CO5	1	2	1	
Avg	1.40	1.80	1.00	

IMS Engineering College, Ghaziabad

Sub Code	**REN-075**
Sub. Name	**Telemetry & Data Transmission**

COURSE OUTCOMES	
CO1	Students will be able to Recognize the various Telemetry systems, coding, and Time Division Multiplexing and Frequency Division Multiplexing techniques.
CO2	Students will be able to Identify and explain the types of errors occurring in measurement systems. .
CO3	Students will be able to Apply various digital techniques to measure voltage, frequency and speed.
CO4	Students will be able to understand basic principles of telemetry systems and systems for data communication.
CO5	Students will be able to understand the purpose of different Telemetry & Remote-control systems in Instrumentation field.

CO-PO Matrix												
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	1	1			1			2
CO2	2	2	2	2	1	1						2
CO3	2	1	2	1	1	1						2
CO4	3	2	2	1	2	2			1			2
CO5	2	2	2	1	2	1						2
CO6												
Average	2.20	1.60	2.00	1.20	1.40	1.20			1.00			2.00

CO-PSO Matrix			
COs	PSO1	PSO2	PSO3
CO1	2	1	2
CO2	2	2	2
CO3	2	1	2
CO4	2	1	2
CO5	2	1	1
CO6			
Average	2.00	1.20	1.80

IMS Engineering College, Ghaziabad

Sub Code	REN-701
Sub. Name	Communication System

	COURSE OUTCOMES	Bloom's Knowledge Level
CO1	Students will be able to apply the basic fundamental of signals analysis used in various field of Engineering.	K3
CO2	Students will be able to explain how signals are transmitted and its reception take place in communication engineering with good quality.	K4
CO3	Students will be able to Sketch the spectrum of different signals used in multidisciplinary field of engineering.	K1
CO4	Understand the various techniques for better communication in multidiscipline field of engineering and it will motivate to work with multidiscipline team member.	K2
CO5	Understand the need of communication engineering in the field of research, and higher-level engineering solutions in global and economical context.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1							1
CO2	2	3	2	2	1	1	1		1	1		2
CO3	3	2	3	2	2	1	1	1			1	3
CO4	2	3	2	1	1	2	1		1	1		2
	2	1	2	1		1	1	1	1	1	1	2
Avg	2.25	2.25	2.00	1.50	1.25	1.33	1.00	1.00	1.00	1.00	1.00	2.00

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3		1	
CO2	3	1	2	
CO3	3		2	
CO4	3	1	2	
CO5	3	2	3	
Avg	**3.00**	**1.33**	**2.00**	

IMS Engineering College, Ghaziabad

Sub Code	**REE-702**
Sub. Name	**Power System Protection**

COURSE OUTCOMES		**Bloom's Level**
CO1	Student will be able to know about different protective schemes used in Power Systems.	
CO2	Students will be able to Know about various protective systems, how it works and where it is used?	
CO3	Student will be able to know the different types, working and applications of relays and grounding in Power Systems.	
CO4	Student will be able to know about the protection of Transmission lines and generators.	
CO5	Student will be able to know the working and applications of Circuit Breakers in Power Systems.	

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	1	1	1							1
CO2	3	3	3	3	2	2	2					3
CO3	3	3	3	3	2	2	2					3
CO4	2	3	3	3	2	2	2					3
CO5	3	3	2	3	2	2	2					3
Avg	2.80	3.00	2.40	2.60	1.80	2.00	2.00					2.60

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	1	1	
CO2	2	1	1	
CO3	2	1	2	
CO4	2	1	1	
CO5	2	1	2	
Avg	2.00	1.00	1.40	

IMS Engineering College, Ghaziabad

Sub Code	**REE-751**
Sub. Name	**Industrial Automation & PLC Lab**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Student will be able to understand the hardware & software used in PLC and implementation of logic gates.	K3
CO2	Student will be able to understand & develop the ladder program for DOL starter and its application as a timer.	K4
CO3	Student will be able to understand the hardware & software used in PLC and implementation of logic gates.	K1
CO4	Student will be able to understand the Performance of Timers & Counters.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1	1							1
CO2	2	3	2	2	1	1	1		1	1		2
CO3	3	2	3	2	2	1	1					3
CO4	2	3	2	1	1	2	1		1	1		2
Avg	2.25	2.25	2.00	1.50	1.25	1.33	1.00	#DIV/0!	1.00	1.00	#DIV/0!	2.00

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3		1	
CO2	3	1	2	
CO3	3		2	
CO4	3	1	2	
Avg	**3.00**	**1.00**	**2.00**	

IMS Engineering College, Ghaziabad

Sub Code	**REE752**
Sub. Name	**Power System Lab**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Analyze the performance of transmission lines and relays	K3
CO2	Calculate the steady-state power flow in a power system.	K2
CO3	nalyze different types of short-circuit faults which occur in power systems	K4
CO4	To perform testing of transformer oil.	K3
CO5	To evaluate sequence components of alternator.	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	2	2						
CO2	2	1	2	1	1	1						
CO3	2	2	2	2	2	1						
CO4	2	2	2	1	2	1						
CO5	1		2	2		1						
Avg	1.80	1.75	1.80	1.60	1.75	1.20						

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	2	1	1	
CO2	2	2	1	
CO3	1	2	1	
CO4	1	2	1	
CO5	1	2	1	
Avg	1.40	1.80	1.00	

Evaluation Scheme B.Tech 4th Year (Electrical & Electronics Engg.)

YEAR 4th / SEMESTER-VIII

S. No.	Subject Code	Subject Name	Department	L-T-P	Th/Lab Marks	Sessional		Total	Credit
					ESE	CT	TA		
1		OPEN ELECTIVE COURSE-2	Other Deptt.	3--0--0	70	20	10	100	3
2		DEPTT ELECTIVE COURSE-5	Core Deptt.	3--1--0	70	20	10	100	4
3		DEPTT ELECTIVE COURSE-6	Core Deptt.	3--0--0	70	20	10	100	3
4	REN851	GD & SEMINAR	Core Deptt.	0--0--3			100	100	2
5	REN852	PROJECT-2	Core Deptt.	0--0--12	350		250	600	12
	TOTAL				560	60	380	1000	24

DEPTT. ELECTIVE COURSE-5

1. REE080: Advanced Control System
2. REE081: Introduction to Power Quality & FACTS
3. REE082: Power System Dynamics, Control and Monitoring (NPTEL)
4. REN080: Optical Fiber Communication

DEPTT. ELECTIVE COURSE-6

1. REE085: EHVAC &DC Transmission
2. REE086: Power Theft & Energy Management
3. REE087: Digital Image Processing
4. REE088: Antennas (NPTEL)

IMS Engineering College, Ghaziabad

Sub Code	**ROE- 082**
Sub. Name	**Entrepreneurship Development**

COURSE OUTCOMES	
CO1	Students will be able to Develop idea generation, creative and innovative skills.
CO2	Students will be able to Aware of different opportunities and successful growth stories. .
CO3	Students will be able to Learn how to start an enterprise and design business plans those are suitable for funding by considering all dimensions of business.
CO4	Students will be able to Understand entrepreneurial process by way of studying different case studies and find exceptions to the process model of entrepreneurship.
CO5	Students will be able to 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
CO6												
Average	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
CO1	1	2	2
CO2		1	1
CO3	2	1	2
CO4	1	1	2
CO5	3	2	2
CO6			
Average	1.75	1.40	1.80

IMS Engineering College, Ghaziabad

Sub Code	**REE-081**
Sub. Name	**Introduction to Power Quality & FACTS**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students will be able to understand the terms and definitions of different power quality problems and standards.	K4
CO2	Students will be able to understand the various causes of voltage sag, how to estimate it and fundamental principle of protection with various mitigation techniques.	K4
CO3	Students will be able to understand the various causes of electrical transients with its various mitigation techniques.	K3
CO4	Students will be able to understand the terms and definitions of various FACTS controllers with their applications.	K4
CO5	Students will be able to understand the terms and definition of harmonics, how to measure it, various causes and effects of harmonics on various electrical equipment with its mitigation techniques.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	2	2			2				2
CO2	3	3	3	3	2	2	2	1				3
CO3	3	3	3	2	2	2	2					3
CO4	3	3	3	2	3	2	2					3
CO5	3	3	3	3	3	2	2					3
Avg	**3.00**	**3.00**	**2.80**	**2.60**	**2.40**	**2.00**	**2.00**	**1.50**				**2.83**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	
CO1	2	1	1	
CO2	2	1	1	
CO3	2	1	2	
CO4	2	1	1	
CO5	2	1	2	
Avg	**2.00**	**1.00**	**1.40**	

IMS Engineering College, Ghaziabad

Sub Code	REE-085
Sub. Name	EHV AC & DC Transmission

COURSE OUTCOMES		Bloom's Knowledge Level
CO1	To understand the basic concepts of EHV AC and HVDC transmission.	K4
CO2	To identify the electrical requirements for HVDC lines.	K4
CO3	To identify the components used in AC to DC conversion.	K3
CO4	To understand the operation of HVDC conversion technology.	K4
CO5	To understand the fundamental requirements of HVDC transmission line design.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	2	2			2				2
CO2	3	3	3	3	2	2	2	1				3
CO3	2	3	3	2	2	2	2					2
CO4	3	1	3	2	3	2	2	1				1
CO5	2	2	3	3	3	2	2	1				3
Avg	**2.40**	**2.00**	**2.80**	**2.60**	**2.40**	**2.00**	**2.00**	**1.50**				**2.20**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	
CO1	3	1	1	
CO2	2	1	1	
CO3	3	1	2	
CO4	2	1	1	
CO5	3	1	2	
Avg	**2.60**	**1.00**	**1.40**	