Department of Computer Science & 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

To be recognized as a Centre of Excellence imparting quality education and creating new opportunities for students to meet the challenges of technological development in Computer Science & Engineering.

Mission

- To promote technical proficiency by adopting effective teaching learning processes.
- To provide environment & opportunity for students to bring out their inherent talents for all round development.
- To promote latest technologies in Computer Science & Engineering and across disciplines in order to serve the needs of Industry, Government, Society, and the scientific community.
- To educate students to be Successful, Ethical and Effective problem-solvers and Life-Long learners who will contribute positively to 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 teamwork: 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. Graduates of the program will be able to apply fundamental principles of engineering in problem solving and understand the role of computing in multiple disciplines.
2. Graduates will learn to apply various computational techniques & tools for developing solutions & projects in real world.
3. Be employed as computer science professionals beyond entry-level positions or be making satisfactory progress in graduate programs.
4. Demonstrate that they can function, communicate, collaborate and continue to learn effectively as ethically and socially responsible computer science professionals.

Program Specific Outcomes (PSO)

1. Foundation of Computer System: Ability to understand the principles and working of computer systems.
2. Foundations of Software development: Possess professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open-source platforms.
3. Foundation of mathematical concepts: Ability to apply mathematical methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm.
4. Applications of Computing and Research Ability: Ability to use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations.

B.TECH (COMPUTER SCIENCE AND 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	Engineering Science Course/Maths IV	3	1	0	30	20	50		100		150	4
2	KAS301/ KVE 301	Technical Communication/Universal Human values	2 3	1 0	0 0	30	20	50		100		150	3
3	KCS301	Data Structure	3	1	0	30	20	50		100		150	4
4	KCS302	Computer Organization and Architecture	3	1	0	30	20	50		100		150	4
5	KCS303	Discrete Structures & Theory of Logic	3	0	0	30	20	50		100		150	3
6	KCS351	Data Structures Using C Lab	0	0	2				25		25	50	1
7	KCS352	Computer Organization Lab	0	0	2				25		25	50	1
8	KCS353	Discrete Structure & Logic Lab	0	0	2				25		25	50	1
9	KCS354	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	**K1 & K3**
CO2	The students will be able to learn the idea of classification of second partial differential equations, wave, heat equation and transmission lines	**K4 & K5**
CO3	The students will be able to learn the basic ideas of statistics including measures of central tendency, correlation, regression and their properties.	**K2**
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.	**K1 & K5**
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.	**K3 & K6**

CO-PO Matrix

Course Outcome	PO 1	PO2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12
CO1	2	2	-	-	1	-	1	-	-	1	1	-
CO2	2	2	1	-	-	-	1	-	-	-	1	1
CO3	2	2	1	1	1	-	-	-	1	1	1	1
CO4	2	2	-	1	1	-	-	-	-	-	1	1
CO5	2	2	1	2	1	-	1	-	1	1	1	1
Avg	2	2	1	1.33	1		1		1	1	1	1

CO-PSO Matrix

Cos	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	-
CO2	1	-	2	1
CO3	1	-	1	-
CO4	1	1	1	-
CO5	1	1	2	1
Avg	1	1	1.4	1

IMS Engineering College, Ghaziabad

Sub Code	**KAS 301**
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.	K2
CO2	Student will utilize the technical writing for Technical communication and its exposure in various dimensions.	K2
CO3	Students would **imbibe inputs** by presentation skills to enhance confidence in face of diverse audience.	K2
CO4	Technical communication skills will **create** a vast know-how of the application of the learning to promote their technical competence.	K6
CO5	It would enable them to **evaluate** their efficacy as fluent & efficient communicators by learning the voice-dynamics	K5

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	2				3	2	3
CO3	1	2	3		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	**1.2**	**1.6**	**2.8**	**1**	**2.2**	**2.25**	**1.67**	**1.75**	**3**	**3**	**2**	**2.6**

CO-PSO Matrix

Cos	PSO1	PSO2	PSO3	PSO4
CO1		2		3
CO2		1		3
CO3	2			3
CO4	1	3		3
CO5				1
Avg	**1.5**	**2**		**2.6**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-301**
Sub. Name	**Data Structure**

COURSE OUTCOMES		**Bloom's Level**
CO1	Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications.	K1, K2
CO2	Discuss the computational efficiency of the sorting and searching algorithms.	K2
CO3	Implementation of Trees and Graphs and perform various operations on these data structure.	K3
CO4	Understanding the concept of recursion, application of recursion and its implementation and removal of recursion.	K4
CO5	Identify the alternative implementations of data structures with respect to its performance to solve a real-world problem.	K5, K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	2	1	1						3
CO2	2	2	3	2	1							3
CO3	1	2	2	2	1	2						3
CO4	2	2	2	2	1							3
CO5	2	2	3	2	1	2						2
Avg	1.6	1.8	2.4	2	1	1.67						2.8

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	
CO2	1	3	2	
CO3	1	2	2	2
CO4	1	2	2	2
CO5	1	1	2	2
Avg	1	2	2	2

IMS Engineering College, Ghaziabad

Sub Code	**KCS-302**
Sub. Name	**Computer Organization &Architecture**

COURSE OUTCOMES		**Bloom's Level**
CO1	Student will be able to study of the basic structure and operation of a digital computer system.	K1, K2
CO2	Student will be able to analysis of the design of arithmetic & logic unit and understanding of the fixed point and floating point arithmetic operations.	K2, K4
CO3	Student will be able to implement control unit techniques and the concept of Pipelining	K3
CO4	Student will be able to understand the hierarchical memory system, cache memories and virtual memory	K2
CO5	Student will be able to understand the different ways of communicating with I/O devices and standard I/O interfaces	K2, K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	1	1	-	-	-	-	-	-	-	1
CO2	3	3	3	2	2	-	1	-	-	-	-	3
CO3	3	3	3	3	2	1	1	-	-	-	-	3
CO4	3	3	3	3	2	1	1	-	-	-	-	3
CO5	3	3	3	3	2	1	1	-	-	-	-	3
Avg	**2.8**	**2.8**	**2.6**	**2.4**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**2.6**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	-	3	1
CO2	2	1	3	2
CO3	2	-	3	2
CO4	3	1	3	3
CO5	3	-	2	2
Avg	**2.4**	**1**	**2.8**	**2**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-303**
Sub. Name	**Discrete Structures and Theory of logic**

COURSE OUTCOMES		**Bloom's Level**
CO1	Write an argument using logical notation and determine if the argument is or is not valid.	K3,K4
CO2	Understand the basic principles of sets and operations in sets.	K1,K2
CO3	Demonstrate an understanding of relations and functions and be able to determine their properties.	K3
CO4	Demonstrate different traversal methods for trees and graphs	K1,K4
CO5	Model problems in Computer Science using graphs and trees.	K2,K6

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1										1
CO2	1	3		2								1
CO3	3	2	2									1
CO4	3	2	2	1								2
CO5	3	2	1	1	3							1
Avg	**2.4**	**2**	**1.67**	**1.33**	**3**							**1.2**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	1		
CO2		2	1	
CO3		3	3	
CO4		3	3	1
CO5		3	3	2
Avg	**2**	**2.4**	**2.5**	**1.5**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-351**
Sub. Name	**Data Structure Using C Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Interpret and compute asymptotic notations of an algorithm to analyze the consumption of resources (time/space).	K2, K5
CO2	Exemplify and implement stack, queue and list ADT, tree and graph to manage the memory using static and dynamic allocations.	K3
CO3	Implement binary search tree to design applications like expression trees.	K5
CO4	Identify, model, solve and develop code for real life problems like shortest path and MST using graph theory.	K1
CO5	Develop and compare the comparison-based search algorithms and sorting Algorithms.	K6
CO6	Identify appropriate data structure and algorithm for a given contextual problem and develop in C.	K1

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	2	1	1					1	3
CO2	2	3	3	2	1	1					1	3
CO3	3	2	3	2	1	1					1	2
CO4	3	2	3	2	1	1					1	3
CO5	2	3	3	2	1	1					1	2
CO6	2	3	3	2	1	1					1	2
Avg	**2.3333**	**2.67**	**3**	**2**	**1**	**1**					**1**	**2.5**

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	3	2
CO5	3	3	1	2
CO6	3	3	1	2
Avg	**3**	**3**	**1.33**	**2**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-352**
Sub. Name	**Computer Organization Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Define, Apply and Design basic digital circuits	K1, K3, K6
CO2	Discuss, Design and Calculate 8 bits I/O, ALU and RTL	K2, K3, K6
CO3	Explain, apply and design the concept of control unit and memory unit	K2, K3, K6
CO4	Define and design algorithm using simulators	K1, K6

CO-PO Matrix

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

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	1		1
CO2	1	1		1
CO3	1	1		1
CO4	1	1	1	1
Avg	**1.00**	**1.00**	**1.00**	**1.00**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-353**
Sub. Name	**Discrete Structures and Theory of logic lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students would be having understanding of working with a mathematical tool Maple	K2
CO2	Students would be able to perform programs of recursion, combinatorics and counting	K3
CO3	Students would be able to perform programs of set theroy, set operations and probability	K3
CO4	Student would be able to implement classical mathematical problme like Birthday paradox based on pigeonhole principle.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	3	1						1		2
CO2	3	2	3	2	2					2		3
CO3	3	2	2	2	1	1					2	2
CO4	3	2	2	2	1	1						3
Avg	**3.00**	**2.00**	**2.50**	**1.75**	**1.33**	**1.00**				**1.50**	**2.00**	**2.50**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	**3**	**1**	**1**	**2**
CO2	**3**	**2**	**2**	**2**
CO3	**3**	**2**	**2**	**2**
CO4	**2**	**3**	**2**	**2**
Avg	**2.75**	**2.00**	**1.75**	**2.00**

IMS Engineering College, Ghaziabad

Sub Code	**KCS354**
Sub. Name	**Summer training/Internship/Mini Project**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students will be able to identify and present the objective and the work done during training	K1
CO2	Students will be able to apply the learned concept through design, analysis and development of mini project	K3
CO3	Students will be able to design and implementation of mini project during their training.	K3, K6
CO4	Students will be able to discuss the result/output and prepare a mini project report	K2

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

CO-PSO Matrix				
COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	2	1	
CO2	1	2	1	1
CO3	1	1	1	1
CO4	1	1		1
Avg	1.00	1.50	1.00	1.00

IMS Engineering College, Ghaziabad

Sub Code	KNC-302
Sub. Name	Python Programming

COURSE OUTCOMES		Bloom's Level
CO1	Students will be able to describe the numbers, math functions, strings, list, tuples and dictionaries in python	K1
CO2	Students will be able to acquire the skills to apply different decision-making statements and functions in python	K3
CO3	Students will be able to interpret object-oriented programming in python	K5
CO4	Students will be able to develop skill to understand and summarize different file handling operations	K6
CO5	Students will be able to demonstrate the ability to design GUI applications in python and evaluate different database operations	K3

CO-PO Matrix												
Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	3	3	2	3				3	3
CO2	3	2	3	3	2	3	2				3	3
CO3	3	2	3	2	3	3	3				3	2
CO4	3	2	3	2	2	2	2				2	3
CO5	3	2	3		3	3	2				2	3
Avg	**3.00**	**2.00**	**2.80**	**2.50**	**2.60**	**2.60**	**2.40**				**2.60**	**2.80**

CO-PSO Matrix				
COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	1	2	1
CO2	2	1	1	1
CO3	2	1	1	1
CO4	2	1	1	1
CO5	2	1	1	1
Avg	**2.00**	**1.00**	**1.20**	**1.00**

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/ KAS301	Universal Human Values/ Technical Communication	3 2	0 1	0 0	30	20	50		100		150	3
3	KCS401	Operating Systems	3	0	0	30	20	50		100		150	3
4	KCS402	Theory of Automata and Formal Languages	3	1	0	30	20	50		100		150	4
5	KCS403	Microprocessor	3	1	0	30	20	50		100		150	4
6	KCS451	Operating Systems Lab	0	0	2				25		25	50	1
7	KCS452	Microprocessor Lab	0	0	2				25		25	50	1
8	KCS453	Python Language Programming 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	**KOE044**
Sub. Name	**Sensor & Instrumentation**

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Student will be able to apply the use of sensors for measurement of displacement, force and pressure.	K3
CO2	Student will be able to employ commonly used sensors in industry for measurement of temperature, position, accelerometer, vibration sensor, flow and level.	K2
CO3	Student will be able to demonstrate the use of virtual instrumentation in automation industries.	K3
CO4	Student will be able to identify and use data acquisition methods.	K1
CO5	Student will be able to comprehend intelligent instrumentation in industrial automation.	K2

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	1	1		2	2						2
CO2	1	2	1	1	2	2					1	2
CO3	2	2	2	2	3	1				1	1	2
CO4	1	1	1	2	3	1	1					2
CO5	2	2	1	2	3	1				1	1	2
Avg	**1.60**	**1.60**	**1.20**	**1.75**	**2.60**	**1.40**	**1.00**			**1.00**	**1.00**	**2.00**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1			3	2
CO2			2	3
CO3	1	1	2	1
CO4	2	2	2	3
CO5	2	2	1	3
Avg	**1.67**	**1.67**	**2.00**	**2.40**

IMS Engineering College, Ghaziabad

Sub Code	KVE-401
Sub. Name	Universal Human Values & Professional Ethics

COURSE OUTCOMES		**Bloom's Knowledge Level**
CO1	Students who complete this course should be able to realize the importance & need of human values and value education to human being.	K2
CO2	Students should be able to realize the importance of self exploration in harmony of family.	K2
CO3	They should be able to understand and appreciate role of harmonious family in peaceful society.	K2
CO4	Students who complete this course should be able to investigate his/her self & make it suitable to society and existence.	K4
CO5	Students should be able to apply the ethical and human values in family, society, nature and professional life.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3						2
CO2						3	2	2				
CO3						3	2		2			
CO4							2	2				
CO5							3	3				2
Avg						**3**	**2.25**	**2.33**	**2**			**2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	
CO2	2	2	1	
CO3	2	1	1	
CO4	1	1	1	
CO5	1	1	1	
Avg	**1.8**	**1.4**	**1**	

IMS Engineering College, Ghaziabad

Sub Code	**KCS-401**
Sub. Name	**Operating System**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the structure and functions of OS	K1, K2
CO2	Learn about Processes, Threads and Scheduling algorithms.	K1, K2
CO3	Understand the principles of concurrency and Deadlocks	K2
CO4	Learn various memory management scheme	K2
CO5	Study I/O management and File systems.	K2, K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1											1
CO2	2	1	1									2
CO3	2	2	2	1								2
CO4	2	1	1									1
CO5	2	2	2	1								2
Avg	1.8	1.5	1.5	1								1.6

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2
CO2	1	2	2	2
CO3	2	2	2	2
CO4	2	2	1	2
CO5	2	2	2	2
Avg	1.8	1.8	1.6	2.0

IMS Engineering College, Ghaziabad

Sub Code	**KCS402**
Sub. Name	**Theory of Automata and Formal Languages**

Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
CO1	Analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars	K4, K6
CO2	Analyse and design, Turing machines, formal languages, and grammars	K4, K6
CO3	Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving	K1, K5
CO4	Prove the basic results of the Theory of Computation.	K2, K3
CO5	State and explain the relevance of the Church-Turing thesis.	K1, K5

CO-PO Matrix												
Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	3	2								1
CO2	1	2	2	2								1
CO3	1	2	2	2								2
CO4	1	2	2	1								1
CO5	1	2	2	1								1
Avg.	1	2	2.2	1.6								1.2

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

IMS Engineering College, Ghaziabad

Sub Code	**KCS 403**
Sub. Name	**Microprocessor**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply a basic concept of digital fundamental to microprocessor-based computer system.	K3, K4
CO2	Analyze a detailed software and hardware structure of the microprocessor	K2, K4
CO-3	Illustrate how the different peripherals (8085/8086) are interfaced with microprocessor	K3
CO4	Analyze the characteristics of Microprocessor	K4
CO5	Evaluate the data transfer information through serial and parallel ports	K5

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1		1	1	-	-	-	2	1	1	-
CO2	3	1	1	2	1	-	-	-	1	2	1	2
CO3	2	2	1	1	1	-	-	-	2	1	1	-
CO4	3	2	2	2	1	-	-	-	1	-	-	-
CO5	3	3	1	1	1	-	-	-	2	1	2	1
Avg	2.6	1.8	1.25	1.4	1	-	-	-	1.6	1.25	1.25	1.5

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	1
CO2	2	3	-	-
CO3	2	2	1	1
CO4	2	2	-	-
CO5	2	2	2	-
Avg	2.2	2.2	1.67	1

IMS Engineering College, Ghaziabad

Sub Code	**KCS-451**
Sub. Name	**Operating System lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students will be able to design and interpret various CPU scheduling algorithm.	K5, K6
CO2	Students will be able to design, develop and implement programs for deadlock handling.	K3, K6
CO3	Students will be able to apply and analyse different page replacement algorithms.	K3, K4
CO4	Students will be able to develop and compare various disk scheduling algorithms	K2, K6

CO-PO Matrix

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

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1
CO2	2	2	2	1
CO3	2	2	2	1
CO4	2	2	2	1
Avg	2	2	2	1

IMS Engineering College, Ghaziabad

Sub Code	**KCS 452**
Sub. Name	**Microprocessor Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Student able to perform experiment of his own.	K3, K5
CO2	Student must able to understand the logic behind experiment and demonstrate the outcome effectively	K2, K4
CO3	Student must able to present the experiment with results effectively.	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	3	2	-	-	-	-	3	-	-	3
CO2	2	3	2	3	-	-	-	-	1	3	-	3
CO3	1	1	1	1	-	-	-	-	-	1	-	3
Avg	1.67	1.67	2	2	-	-	-	-	2	2	-	3

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	-	2	-
CO2	2	-	3	-
CO3	2	-	2	-
Avg	2	-	2.33	-

IMS Engineering College, Ghaziabad

Sub Code	**KCS453**
Sub. Name	**Python Language Programming Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students will be able to describe the numbers, math functions, strings, list, tuples and dictionaries in python	K2
CO2	Students will be able to acquire the skills to apply different decision-making statements and functions in python	K2, K3
CO3	Students will be able to interpret object-oriented programming in python	K2, K3
CO4	Students will be able to develop skill to understand and summarize different file handling operations	K3, K4
CO5	Students will be able to demonstrate the ability to design GUI applications in python and evaluate different database operations	K3, K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	3	2	3				3	3
CO2	3	2	3	3	2	3	2				3	3
CO3	3	2	3	2	3	3	3				3	2
CO4	3	2	3	2	2	2	2				2	3
CO5	3	2	3		3	3	2				2	3
Avg	3.00	2.00	2.80	2.50	2.60	2.60	2.40				2.60	2.80

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	1
CO2	2	1	1	1
CO3	2	1	1	1
CO4	2	1	1	1
CO5	2	1	1	1
Avg	2.00	1.00	1.20	1.00

IMS Engineering College, Ghaziabad

Sub Code	**KNC-401**
Sub. Name	**Computer System and 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	K3
CO2	To discover cyber-attack scenarios to web browsers and web servers and to explain how to mitigate such threat	K3
CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K2, K3
CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	K2
CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K2, K3

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

CO-PSO Matrix				
COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	3	1	2
CO2	2	2	1	1
CO3	2	2	1	1
CO4	2	2	1	1
CO5	2	2	1	1
Avg	**2.20**	**2.20**	**1.00**	**1.20**

B.TECH (COMPUTER SCIENCE & ENGINEERING/ COMPUTER SCIENCE)
CURRICULUM STRUCTURE

SEMESTER- V

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KCS501	Database Management System	3	1	0	30	20	50		100		150	4
2	KCS502	Compiler Design	3	1	0	30	20	50		100		150	4
3	KCS503	Design and Analysis of Algorithm	3	1	0	30	20	50		100		150	4
4	Deptt. Elective-I	Departmental Elective-I	3	0	0	30	20	50		100		150	3
5	Deptt. Elective-II	Departmental Elective-II	3	0	0	30	20	50		100		150	3
6	KCS551	Database Management System Lab	0	0	2				25		25	50	1
7	KCS552	Compiler Design Lab	0	0	2				25		25	50	1
8	KCS553	Design and Analysis of Algorithm Lab	0	0	2				25		25	50	1
9	KCS554	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.

Departmental Elective-I

1. KCS-051 Data Analytics
2. KCS-052 Web Designing
3. KCS-053 Computer Graphics
4. KCS-054 Object Oriented System Design

Departmental Elective-II

1. KCS-055 Machine Learning Techniques
2. KCS-056 Application of Soft Computing
3. KCS-057 Augmented & Virtual Reality
4. KCS-058 Human Computer Interface

IMS Engineering College, Ghaziabad

Sub Code	**KCS-501**
Sub. Name	**Database Management System**

COURSE OUTCOMES		**Bloom's Level**
CO1	Apply knowledge of database for real life applications.	K3
CO2	Apply query processing techniques to automate the real time problems of databases.	K3, K4
CO3	Identify and solve the redundancy problem in database tables using normalization.	K2, K3
CO4	Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and recovery.	K2, K4
CO5	Design, develop and implement a small database project using database tools.	K3, K6

CO-PO Matrix

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

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	1	3	1
CO2	3	1	3	1
CO3	3	1	3	1
CO4	3	1	3	1
CO5	3	1	3	1
Avg	**3**	**1**	**3**	**1**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-502**
Sub. Name	**Compiler Design**

COURSE OUTCOMES		**Bloom's Level**
CO1	Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.	K3, K6
CO2	Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table	K2, K6
CO3	Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.	K4, K5
CO4	Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.	K2, K3
CO5	Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization.	K2, K4

CO-PO Matrix

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

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	1
CO2	1	3	2	1
CO3	3	2	1	1
CO4	3	2	2	1
CO5	3	2	2	1
Avg	**2.6**	**2**	**1.6**	**1**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-503**
Sub. Name	**Design & analysis of algorithm**

	COURSE OUTCOMES	**Bloom's Level**
CO1	Understand the process of analysing the Time and Space complexity of algorithms. Sorting problems will be evaluated for time and space complexity.	K2
CO2	Understand and apply the concepts Advance data structures like Red- Black Trees, B-Trees, Binomial Heaps, Fibonacci Heaps, etc.	K1, K3
CO3	Apply the Divide & conquer design strategy to various problems. Understanding the difference between Divide & Conquer& Dynamic programming design strategies.	K3, K4
CO4	Understanding and applying the concepts of Greedy programming, Back Tracking & Branch & Bound algorithm design approaches to problems of real world.	K2, K3
CO5	Understand the concepts of applying the Non-Deterministic and approximation approach to complex problems	K2

CO-PO Matrix												
Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2									3
CO2	2	2	3	3	2				2			2
CO3	2	2	3	3	2				2			3
CO4	2	2	3	3	2				2			3
CO5	1	1	1	1								2
Avg	**2**	**2**	**2.4**	**2.5**	**2**				**2**			**2.6**

CO-PSO Matrix				
COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	1	3	
CO2	2	2	3	2
CO3	2	2	3	2
CO4	2	2	3	2
CO5	2	2	1	2
Avg	**2**	**1.8**	**2.6**	**2**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-052**
Sub. Name	**Web Designing**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand principle of Web page design and about types of websites	K2
CO2	Visualize and recognize the basic concept of HTML and application in web designing.	K2, K3
CO3	Recognize and apply the elements of Creating Style Sheet (CSS).	K2, K3
CO4	Understand the basic concept of Java Script and its application.	K2
CO5	Introduce basics concept of Web Hosting and apply the concept of SEO	K2, K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1	3				1	3	1	3
CO2	1	1	2	1	3				3	3	2	3
CO3	1	1	2	1	3				3	3	3	3
CO4	1	1	3	3	3				3	3	3	3
CO5	1	1	3	1	3			3	3	3	3	3
Avg	**1**	**1**	**2.2**	**1.4**	**3**			**3**	**2.6**	**3**	**2.4**	**3**

CO-PSO Matrix

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

IMS Engineering College, Ghaziabad

Sub Code	**KCS-056**
Sub. Name	**Application of Soft Computing**

COURSE OUTCOMES		**Bloom's Level**
CO1	Recognize the feasibility of applying a soft computing methodology for a particular problem	K2, K4
CO2	Understand the concepts and techniques of soft computing and foster their abilities in designing and implementing soft computing based solutions for real-world and engineering problems.	K2, K4.K6
CO3	Apply neural networks to pattern classification and regression problems and compare solutions by various soft computing approaches for a given problem.	K3,K5
CO4	Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems	K3,K4
CO5	Apply genetic algorithms to combinatorial optimization problems	K3,K5

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3		3								2
CO2	3		3	2		2	1					2
CO3	3	3	2	3							2	2
CO4	3		1					1			2	2
CO5	3	3	2								2	2
Avg	**3**	**3**	**2**	**2.66**		**2**	**1**	**1**			**2**	**2**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3			1
CO2	3			
CO3	2	3	2	3
CO4	2	3	3	3
CO5	2	3		3
Avg	**2.4**	**3**	**2.5**	**2.5**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-551**
Sub. Name	**Database Management System Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand and apply oracle 11 g products for creating tables, views, indexes, sequences and other database objects.	K2, K4
CO2	Design and implement a database schema for company data base, banking data base, library information system, payroll processing system, student information system.	K5, K6
CO3	Write and execute simple and complex queries using DDL, DML, DCL and TCL	K4, K5
CO4	Write and execute PL/SQL blocks, procedure functions, packages and triggers, cursors.	K4, K5
CO5	Enforce entity integrity, referential integrity, key constraints, and domain constraints on database.	K3, K4

CO-PO Matrix

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

CO-PSO Matrix

Cos	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1
Avg	**3**	**2**	**1**	**1**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-552**
Sub. Name	**Compiler Design lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Identify patterns, tokens & regular expressions for lexical analysis	K2
CO2	Design Lexical analyser for given language using C and LEX /YACC tools	K3, K5
CO3	Design and analyse top down and bottom up parsers.	K4, K5
CO4	Generate the intermediate code	K4, K5
CO5	Generate machine code from the intermediate code forms	K3, K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2									2
CO2	1	2	1	1	1							1
CO3	1	2	2	2	1							2
CO4	2	2	1	1	1						1	1
CO5	1	2	1	2	1						1	2
Avg	**1.2**	**1.8**	**1.4**	**1.5**	**1**						**1**	**1.6**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	1
CO2	1	2	2	1
CO3	2	1	1	1
CO4	1	2	1	1
CO5	2	2	2	1
Avg	**1.6**	**1.6**	**1.4**	**1**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-553**
Sub. Name	**Design and Analysis of Algorithm Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Implement algorithm to solve problems by iterative approach.	K4, K5
CO2	Implement algorithm to solve problems by divide and conquer approach	K4, K5
CO3	Implement algorithm to solve problems by Greedy algorithm approach.	K4, K5
CO4	Implement algorithm to solve problems by Dynamic programming, backtracking, branch and bound approach.	K4, K5
CO5	Implement algorithm to solve problems by branch and bound approach.	K4, K5

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1	1							2
CO2	2	2	2	2	2							2
CO3	2	2	2	2	2							2
CO4	2	2	2	2	2							2
CO5	2	2	2	2	2							2
Avg	**2**	**2**	**2**	**1.8**	**1.8**							**2**

CO-PSO Matrix

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

IMS Engineering College, Ghaziabad

Sub Code	**KCS-554**
Sub. Name	**Mini-Project or Internship Assessment**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students are expected to present the objective and the work done during training	K2, K3
CO2	Students are expected to apply the learned concept through design, analysis and development of mini project	K2, K3
CO3	Students are expected to present overall working and implementation of mini project during their presentation	K2, K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	1	2	1	1		1	1	1	1	1
CO2	3	3	3	3	3	1	1	1	2	2	3	2
CO3	3	3	3	3	3			2		3	3	3
CO4	1	1	3	2	3			1		3	2	2
Avg	**2.00**	**2.25**	**2.50**	**2.50**	**2.50**	**1.00**	**1.00**	**1.25**	**1.50**	**2.25**	**2.25**	**2.00**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	2	2	1
CO2	3	3	3	3
CO3	3	3	3	3
CO4	1	1	1	1
Avg	**2.00**	**2.25**	**2.25**	**2.00**

IMS Engineering College, Ghaziabad

Sub Code	**KNC-502**
Sub. Name	**INDIAN TRADITIONS, CULTURAL AND SOCIETY**

COURSE OUTCOMES		**Bloom's 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.	K1, K2
CO2	To enable the students to understand the importance of our surroundings and encourage the students to contribute towards sustainable development.	K1, K2
CO3	To sensitize students towards issues related to 'Indian' culture, tradition and its composite character.	K2, K3
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.	K2, 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.	K1, K2

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**	**3**		**3**	**3**	**1.8**	**3**			**1.6**

CO-PSO Matrix

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

SEMESTER- VI												
Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KCS601	Software Engineering	3	1	0	30	20	50		100		150	4
2	KCS602	Web Technology	3	1	0	30	20	50		100		150	4
3	KCS603	Computer Networks	3	1	0	30	20	50		100		150	4
4	Deptt. Elective-III	Departmental Elective-III	3	0	0	30	20	50		100		150	3
5		Open Elective-I [Annexure - B(iv)]	3	0	0	30	20	50		100		150	3
6	KCS651	Software Engineering Lab	0	0	2				25		25	50	1
7	KCS652	Web Technology Lab	0	0	2				25		25	50	1
8	KCS653	Computer Networks 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			
10		MOOCs (Essential for Hons. Degree)											
		Total	**0**	**3**	**6**							**900**	**21**

Departmental Elective-I

1. KCS-051 Data Analytics
2. KCS-052 Web Designing
3. KCS-053 Computer Graphics
4. KCS-054 Object Oriented System Design

Departmental Elective-II

1. KCS-055 Machine Learning Techniques
2. KCS-056 Application of Soft Computing
3. KCS-057 Augmented & Virtual Reality
4. KCS-058 Human Computer Interface

Departmental Elective-III

1. KCS-061 Big Data
2. KCS-062 Image Processing
3. KCS-063 Real Time Systems
4. KCS-064 Data Compression

B.Tech. VI Semester (2020-21)

OPEN ELECTIVE-I

KOE060	IDEA TO BUSINESS MODEL
KOE061	REAL TIME SYSTEMS
KOE062	EMBEDDED SYSTEM
KOE063	INTRODUCTION TO MEMS
KOE064	OBJECT ORIENTED PROGRAMMING
KOE065	COMPUTER BASED NUMERICAL TECHNIQUES
KOE066	GIS & REMOTE SENSING
KOE067	BASICS OF DATA BASE MANAGEMENT SYSTEM
KOE068	SOFTWARE PROJECT MANAGEMENT
KOE069	UNDERSTANDING THE HUMAN BEING COMPREHENSIVELY-HUMAN ASPIRATIONS AND ITS FULFILLMENT

IMS Engineering College, Ghaziabad

Sub Code	**KCS-601**
Sub. Name	**Software Engineering**

COURSE OUTCOMES		**Bloom's Level**
CO1	Explain various software characteristics and analyse different software Development Models.	K1, K2
CO2	Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards.	K1, K2
CO3	Compare and contrast various methods for software design	K2, K3
CO4	Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing.	K3
CO5	Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.	K5

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1							1	2
CO2	2	2	2	2	1	1					1	3
CO3	2	2	3	2	2	1					2	3
CO4	2	2	2	2	1	1					2	3
CO5	2	3	3	1	1	1					2	3
Avg	**2.2**	**2.2**	**2.4**	**1.6**	**1.25**	**1**					**1.6**	**2.8**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	1
CO2	1	3	2	1
CO3	1	3	2	1
CO4		1	3	1
CO5	2	1	2	2
Avg	**1.25**	**2**	**2**	**1.2**

IMS Engineering College, Ghaziabad

Sub Code	**KCS 602**
Sub. Name	**Web Technology**

COURSE OUTCOMES		**Bloom's Level**
CO1	Explain web development Strategies and Protocols governing Web.	K1, K2
CO2	Develop Java programs for window/web-based applications.	K2, K3
CO3	Design web pages using HTML, XML, CSS and JavaScript.	K2, K3
CO4	Creation of client-server environment using socket programming	K1, K2
CO5	Building enterprise level applications and manipulate web databases using JDBC	K3, K4
CO6	Design interactive web applications using Servlets and JSP	K2, K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1				1	1		2	1	1	1	2
CO2	1	3	3	2	2			1	2	2	2	3
CO3	1	1	2	2	2	1		2	2	2	2	2
CO4	1	2	2	2	2	1		2	2	2	2	2
CO5	1	2	2	2	3	1		2	3	2	2	3
CO6	1	2	2	2	3	1		2	3	2	2	3
Avg	**1**	**2**	**2.2**	**2**	**2.17**	**1**		**1.8**	**2.17**	**1.8**	**1.8**	**2.5**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1
CO2	1	2	2	3
CO3	1	2	2	3
CO4	1	2	2	3
CO5	1	2	2	3
CO6	1	2	2	3
Avg	**1**	**1.8**	**1.8**	**2.7**

IMS Engineering College, Ghaziabad

Sub Code	**KCS603**
Sub. Name	**Computer Networks**

COURSE OUTCOMES		**Bloom's Level**
CO1	Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission	K1, K2
CO2	Apply channel allocation, framing, error and flow control techniques.	K3
CO3	Describe the functions of Network Layer i.e. Logical addressing, subnetting & Routing Mechanism.	K2, K3
CO4	Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism	K2, K3
CO5	Explain the functions offered by session and presentation layer and their Implementation	K2, K3
CO6	Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN.	K2

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1								2
CO2	3	2	2	2	1						1	2
CO3	3	3	2	2	1				1	1	1	3
CO4	3	3	2	1							1	3
CO5	3	3	2	1							1	3
CO6	2	2	2									2
Avg	**2.83**	**2.50**	**2.00**	**1.40**	**1.00**				**1.00**	**1.00**	**1.00**	**2.50**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2		2	1
CO2	1	1	1	1
CO3	2		2	1
CO4	2		1	1
CO5	2	1	2	2
CO6	1			
Avg	**1.67**	**1.00**	**1.60**	**1.20**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-061**
Sub. Name	**BIG DATA**

COURSE OUTCOMES		**Bloom's Level**
CO1	Demonstrate knowledge of Big Data Analytics concepts and its applications in business.	K1, K2
CO2	Demonstrate functions and components of Map Reduce Framework and HDFS	K1, K2
CO3	Discuss Data Management concepts in NoSQL environment.	K2, K3
CO4	Explain process of developing Map Reduce based distributed processing applications	K3
CO5	Explain process of developing applications using HBASE, Hive, Pig et	K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3	2				2		3
CO2	2	2	3	3	2					2		2
CO3	2	2	2	3	2					2		3
CO4	3	2	3	2	2					2		3
CO5	1	1	1	1						2		2
Avg	**2.2**	**1.8**	**2.2**	**2.2**	**2.25**	**2**				**2**		**2.6**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	2
CO2	3	2		1
CO3	2	2	1	1
CO4	2	2	2	1
CO5	2	2	1	2
Avg	**2.4**	**2**	**1.75**	**1.4**

IMS Engineering College, Ghaziabad

Sub Code	**KCS062**
Sub. Name	**Image Processing**

COURSE OUTCOMES		**Bloom's Level**
CO1	Explain the basic concepts of two-dimensional signal acquisition, sampling, quantization and color model.	K1, K2
CO2	Apply image processing techniques for image enhancement in both the spatial and frequency domains.	K2, K3
CO3	Apply and compare image restoration techniques in both spatial and frequency domain.	K2, K3
CO4	Compare edge based and region-based segmentation algorithms for ROI extraction.	K3, K4
CO5	Explain compression techniques and descriptors for image processing.	K2, K3

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2								2
CO2	3	2	2	2	1							2
CO3	3	2	2	2	1							2
CO4	3	3	2	2	2							3
CO5	3	3	3	1	1							3
Avg	**3.00**	**2.40**	**2.20**	**1.80**	**1.25**							**2.40**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2		1	1
CO2	2	1	1	1
CO3	1	1	1	1
CO4	2	1	2	2
CO5	1	1	1	1
Avg	**1.60**	**1.00**	**1.20**	**1.20**

IMS Engineering College, Ghaziabad

Sub Code	**KOE-064**
Sub. Name	**Object Oriented Programming**

COURSE OUTCOMES		**Bloom's Level**
CO1	Understand the Basic concept of Object Orientation, object identity and Encapsulation.	K2
CO2	Understand the Basic concept of Basic Structural Modeling.	K2
CO3	Know the knowledge of Object oriented design, Object design.	K2, K3
CO4	Know the knowledge of C++ Basics	K2, K3
CO5	Understand the Basics of object and class in C++.	K2, K3

CO-PO Matrix

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

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2			1
CO2	2			
CO3	2	2	2	2
CO4	2	2	2	2
CO5	2	2		2
Avg	**2**	**2**	**2**	**1.75**

IMS Engineering College, Ghaziabad

Sub Code	KCS-651
Sub. Name	Software Engineering Lab

COURSE OUTCOMES		Bloom's Level
CO1	Identify ambiguities, inconsistencies and incompleteness from a requirements specification and state functional and non-functional requirement.	K2, K3
CO2	Identify different actors and use cases from a given problem statement and draw use case diagram to associate use cases with different types of relationship	K2, K3
CO3	Draw a class diagram after identifying classes and association among them	K4, K5
CO4	Graphically represent various UML diagrams, and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially	K4, K5
CO5	Able to use modern engineering tools for specification, design, implementation and testing	K3, K4

CO-PO Matrix

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

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	1			1
CO2	3	3	1	3
CO3	2	3	1	3
CO4	3	3	1	3
CO5	3	3	1	3
Avg	**2.4**	**3**	**1**	**2.6**

IMS Engineering College, Ghaziabad

Sub Code	**KCS-652**
Sub. Name	**Web technology Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students must be able to learn basics of web technology	K2
CO2	Students must be able to understand the logic behind the experiment & demonstrate the outcomes effectively.	K3, K4
CO3	Students must be able to present the experiment & its results effectively in documentation.	K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	1	1									
CO2	2	3	2									
CO3	3	2	1									
Avg	**2**	**2**	**1.3**									

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	2	1	1
CO2	1	1	2	2
CO3	2	1	1	1
Avg	**1.3**	**1.3**	**1.3**	**1.3**

IMS Engineering College, Ghaziabad

Sub Code	**KCS653**
Sub. Name	**Computer Networks Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Simulate different network topologies.	K3, K4
CO2	Implement various framing methods of Data Link Layer.	K3, K4
CO3	Implement various Error and flow control techniques	K3, K4
CO4	Implement network routing and addressing techniques.	K3, K4
CO5	Implement transport and security mechanisms.	K3, K4

CO-PO Matrix

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

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2		1	
CO2	2	1	1	1
CO3	1		1	
CO4	2		2	1
CO5	1			1
Avg	**1.60**	**1.00**	**1.25**	**1.00**

IMS Engineering College, Ghaziabad

Sub Code	**KNC-601**
Sub. Name	**CONSTITUTION OF INDIA, LAW AND ENGINEERING**

COURSE OUTCOMES		**Bloom's Level**
CO1	To acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.	K1, K2
CO2	To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.	K1, K2
CO3	To channelize students' thinking towards basic understanding of the legal concepts and its implications for engineers.	K2, K3
CO4	To acquaint students with latest intellectual property rights and innovation environment with related regulatory framework	K3, K4
CO5	To make students learn about role of engineering in business organizations and e-governance.	K1, K2

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	3		3	3	1.8	3			1.6

CO-PSO Matrix

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

B.Tech. (Computer Science and Engineering)
VII SEMESTER

SI. No.	Subject Code	Subject Name	L-T-P	Th/Lab Marks	Sessional		Total	Credit
				ESE	CT	TA		
1	Open Elective-1	Open Elective Course -1	3--0--0	70	20	10	100	3
2	CS Elective-3	Deptt Elective Course-3	3--0--0	70	20	10	100	3
3	CS Elective-4	Deptt Elective Course-4	3--1--0	70	20	10	100	4
4	RCS701	Distributed System	3--1--0	70	20	10	100	4
5	RCS702	Artificial Intelligence	3--0--0	70	20	10	100	3
6	RCS751	Distributed System Lab	0--0--2	50		50	100	1
7	RCS752	Artificial Intelligence Lab	0--0--2	50		50	100	1
8	RCS753	Industrial Training	0--0--3			100	100	2
9	RCS754	Project	0--0--6			200	200	3
	TOTAL			450	100	450	1000	24

B.TECH.
VII SEMESTER 2020-21

REVISED OPEN ELECTIVE-I

1.	ROE070	HUMAN VALUES IN SANKHAY YOGA AND VEDANTA DARSAN
2.	ROE071	MODELLING AND SIMULATION OF DYNAMIC SYSTEMS
3.	ROE072	INTRODUCTION TO SMART GRID
4.	ROE073	CLOUD COMPUTING
5.	ROE074	UNDERSTANDING THE HUMAN BEING COMPREHENSIVELY - HUMAN ASPIRATIONS AND ITS FULFILLMENT
6.	ROE075	AUTOMATION AND ROBOTICS
7.	ROE076	COMPUTERIZED PROCESS CONTROL
8.	ROE077	MODELING OF FIELD-EFFECT NANO DEVICES
9.	ROE078	QUALITY MANAGEMENT
10.	ROE079	GIS & REMOTE SENSING
11.	ROE080	HUMAN VALUES IN BUDDHA AND JAIN DARSHAN

DEPARTMENTAL ELECTIVES

CS-ELECTIVE -3:

1. RCS070 Embedded Systems
2. RCS071 Application of Soft Computing
3. RCS072 High Performance Computing
4. RCS073 Human Computer Interface

CS-ELECTIVE-4:

1. RCS075 Cloud Computing
2. RCS076 Blockchain Architecture Design
3. RCS077 Agile Software Development
4. RCS078 Augmented & Virtual Reality

IMS Engineering College, Ghaziabad

Sub Code	**ROE-074**
Sub. Name	**UNDERSTANDING THE HUMAN BEING COMPREHENSIVELY - HUMAN ASPIRATIONS AND ITS FULFILLMENT**

COURSE OUTCOMES		**Bloom's Level**
CO1	To help the students having the clarity about human aspirations, goal, activities and purpose of life.	K1,K3
CO2	To facilitate the competence to understand the harmony in nature/existence and Participation of human being in the nature/existence.	K2
CO3	To help the students to develop the understanding of human tradition and its various components	K2,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
CO3								1				2
Avg						1.5		1				1.33

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	2	1	
CO2	1	1	1	1
CO3	1	1	1	1
Avg	**1**	**1.33333**	**1**	**1**

IMS Engineering College, Ghaziabad

Sub Code	RCS-071
Sub. Name	Application of Soft Computing

COURSE OUTCOMES		Bloom's Level
CO1	Recognize the feasibility of applying a soft computing methodology for a particular problem	K2, K4
CO2	Understand the concepts and techniques of soft computing and foster their abilities in designing and implementing soft computing based solutions for real-world and engineering problems.	K2, K4, K6
CO3	Apply neural networks to pattern classification and regression problems and compare solutions by various soft computing approaches for a given problem.	K3, K5
CO4	Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems	K3, K4
CO5	Apply genetic algorithms to combinatorial optimization problems	K3, K5

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3		3								2
CO2	3		3	2		2	1					2
CO3	3	3	2	3							2	2
CO4	3		1					1			2	2
CO5	3	3	2								2	2
Avg	**3**	**3**	**2**	**2.66**		**2**	**1**	**1**			**2**	**2**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3			1
CO2	3			
CO3	2	3	2	3
CO4	2	3	3	3
CO5	2	3		3
Avg	**2.4**	**3**	**2.5**	**2.5**

IMS Engineering College, Ghaziabad

Sub Code	RCS-075
Sub. Name	Cloud Computing

COURSE OUTCOMES		Bloom's Level
CO1	Student will be able to **understand** the fundamental of cloud computing and **demonstrate** characteristics of cloud computing.	K2
CO2	Student will be able to **describe** the concept of virtualization and **implement** their mechanism with service oriented architecture.	K1
CO3	Student will be able to **discuss** cloud architecture and **Organize** cloud data in Public, Private and Hybrid Clouds on cloud storage.	K1,K5
CO4	Student will be able to **examine** the cloud data by Resource provisioning methods and **implement** global security on it.	K3,K5
CO5	Student will be able to **analyze** the virtual box and **use** programming environment for Google app engine.	K4,K6

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1									1
CO2	2	2	2	1								1
CO3	2	3	3	2								2
CO4	1	1	1									1
CO5	2	3	3	2								2
Avg	**1.8**	**2.2**	**2**	**1.67**								**1.4**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	1		1	1
CO2	1			
CO3	1	1	1	
CO4	1			
CO5	1	2	1	1
Avg	**1**	1.5	1	**1**

IMS Engineering College, Ghaziabad

Sub Code	RCS-701
Sub. Name	Distributed Systems

COURSE OUTCOMES		Bloom's Level
CO1	Students will be able to define the principles and architectural models of Distributed Systems in order to determine the global system state and identify the clock models used in distributed systems.	K1
CO2	Students will be able to identify the requirements of Mutual Exclusion and describe various deadlock detection strategies.	K1
CO3	Students will be able to illustrate the System models of Agreement Problems and application of these agreement protocols in real life problems like Atomic commit in DDBS.	K3
CO4	Students will be able to classify the failure recovery (forward/backward) in concurrent systems and formulating algorithms for achieving fault tolerance in distributed systems.	K4
CO5	Students will be able to compare various methods used for attaining concurrency control in distributed transactions and resolving the distributed deadlocks in transactions.	K2

CO-PO Matrix

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

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	
CO2	2	2	3	
CO3	3	2	3	
CO4	2	2	3	
CO5	2	2	3	
Avg	2.4	2	3	

IMS Engineering College, Ghaziabad

Sub Code	RCS 702
Sub. Name	Artificial Intelligence

COURSE OUTCOMES		Bloom's Level
CO1	Understanding the fundamental aspects of AI and Intelligent agents in AI.	K2
CO2	Designing various AI searching algorithm for real life problems.	K6
CO3	Implementing knowledge representation schemes for predicates used in knowledge based system	K3
CO4	Understanding the Machine learning concepts & its fundamental algorithms.	K2
CO5	Discussing pattern recognition techniques & its role in AI.	K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1							1	2
CO2	3	3	2	2	3						1	2
CO3	3	3	2	2	3						1	2
CO4	3	2	3	3							1	3
CO5	3	2	3	1							1	3
Avg	2.6	2.2	2.2	1.8	3						1	2.4

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	
CO2	3	3	3	1
CO3	3	3	3	1
CO4	2	2	1	3
CO5	2	1	2	3
Avg	**2.4**	**2**	**2**	**2**

IMS Engineering College, Ghaziabad

Sub Code	**RCS-751**
Sub. Name	**Distributed Systems lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students are able to perform Resource allocation and deadlock detection and avoidance techniques in the distributed system.	K4
CO2	Students are able to understand remote procedure call for various applications.	K2
CO3	Students are able to understand IPC mechanism in distributed system.	K2
CO4	Students are able to Design and build application programs on distributed systems.	K5, K6
CO5	Students are able to design and build newer distributed file systems for any OS.	K5, K6

CO-PO Matrix

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

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	
CO2	2	2	3	
CO3	3	2	3	
CO4	2	2	3	
CO5	2	2	3	
Avg	**2.4**	**2**	**3**	

IMS Engineering College, Ghaziabad

Sub Code	**RCS752**
Sub. Name	**Artificial Intelligence Lab**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students must study and perform the experiments using Prolog language in assigned labs.	K1
CO2	Students must be able to understand the logic behind different AI programs & demonstrate the outcomes effectively using Prolog.	K2
CO3	Students must be able to explain the outcomes of programs using Prolog and effectively document the practicals in lab files.	K4

CO-PO Matrix

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

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	3	3	
CO2	2	3	3	3
CO3	2	3	3	3
Avg	**2**	**3**	**3**	**3**

IMS Engineering College, Ghaziabad

Sub Code	**RCS 753**
Sub. Name	**Industrial training**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students must be able to demonstrate their learning effectively through presentation.	K2,K3,K5
CO2	Students are expected to apply & demonstrate their learning through a meaningful project.	K3, K6
CO3	Students must learn to demonstrate their learning & work done through effective documentation in the form of project report.	K1, K5

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	2	2	2	1	1	1	2	3	3	2
CO2	2	3	3	3	2			2	3	3	3	3
CO3	1	2	2	2	2	1	1	1	2	3	3	2
Avg	**1.3**	**2.3**	**2.3**	**2.3**	**2**	**1**	**1**	**1.3**	**2.3**	**3**	**3**	**2.3**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	1	1	2
CO2	3	3	2	3
CO3	2	1	1	2
Avg	**2.3**	**1.6**	**1.3**	**2.3**

IMS Engineering College, Ghaziabad

Sub Code	**RCS754**
Sub. Name	**Project**

COURSE OUTCOMES		**Bloom's Level**
CO1	To identify a real world problem in a clear and concise manner demonstrating a sound technical knowledge in form of synopsis covering problem understanding, project objectives, expected features and results.	K1, K2
CO2	To identify and summarize an appropriate list of literature review, analyse previous researchers' work and relate them to current project.	K2
CO3	To understand how to collect primary data from the field according to the requirements, analyse the collected data in form of tables, bar chats, pie charts, etc. and create a paper model for the project.	K2
CO4	To undertake problem identification, formulation and design engineering solutions to complex problems utilising a systems approach.	K2, K3
CO5	To validate the results with defined project objectives through standard or benchmark procedures.	K3
CO6	To present the project outlining the approach and expected results using good oral and written presentation skills thereby producing a written project report that record and compile work done throughout the project.	K3, K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2		2		1	1	1	2	1	2	2
CO2	1	3	1	2		1			2			1
CO3	2	2	2	2	2	1	1		1		2	2
CO4	2	2	3	1	1	1			2		2	2
CO5	2	2	3	2	2	1	1	1	2	1	3	2
CO6	2	2	2	1	1	1	1	1	2	3	3	2
Avg	**1.67**	**2.17**	**2.20**	**1.67**	**1.50**	**1.00**	**1.00**	**1.00**	**1.83**	**1.67**	**2.40**	**1.83**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	1	1	2
CO2	1	3	1	2
CO3	1	3	2	2
CO4	2	2	2	1
CO5	1	3	2	2
CO6	3	2	2	2
Avg	**1.83**	**2.33**	**1.67**	**1.83**

B.Tech. (Computer Science and Engineering)
VIII SEMESTER

Sl. No.	Subject Code	Subject Name	L-T-P	Th/Lab Marks	Sessional		Total	Credit
				ESE	CT	TA		
1	Open Elective-2	Open Elective Course-2	3--0--0	70	20	10	100	3
2	CS Elective-5	Deptt Elective Course-5	3--1--0	70	20	10	100	4
3	CS Elective-6	Deptt Elective Course-6	3--0--0	70	20	10	100	3
4	RCS851	Seminar	0--0--3			100	100	2
5	RCS852	Project	0--0--12	350		250	600	12
	TOTAL			560	60	380	1000	24

Open Electives II (VIII Semester)		
Sl. No.	Subject Code	Name of Elective(s)
1	ROE081	Digital and Social Media Marketing
2	ROE082	Entrepreneurship Development
3	ROE083	Machine Learning
4	ROE084	Micro and Smart Systems
5	ROE085	Operations Research
6	ROE086	Renewable Energy Resources
7	ROE087	*Human Values in Madhyasth Darshan
8	ROE088	*Values, Relationship & Ethical Human Conduct-For a Happy & Harmonious Society

CS-ELECTIVE-5:

1. RCS080 Machine Learning (Mapping with MOOCS: https://onlinecourses.nptel.ac.in/noc17_cs17/preview https://onlinecourses.nptel.ac.in/noc17_cs26/preview)
2. RCS081 Game Programming
3. RCS082 Image Processing (Mapping with MOOCS: https://onlinecourses.nptel.ac.in/noc18_ee40/preview https://nptel.ac.in/courses/106105032/
4. RCS083 Parallel and Distributed Computing (Mapping with MOOCS: https://nptel.ac.in/courses/106102114/, https://nptel.ac.in/courses/106104024/)

CS-ELECTIVE-6:

1. RCS085 Speech Natural language processing (Mapping with MOOCS: https://nptel.ac.in/courses/106101007/ https://nptel.ac.in/courses/106105158/)
2. RCS086 Deep Learning (Mapping with MOOCS: https://onlinecourses.nptel.ac.in/noc18_cs41/preview)
3. RCS087 Data Compression
4. RCS088 Quantum Computing (Mapping with MOOCS: https://onlinecourses.nptel.ac.in/noc18_cy07)

IMS Engineering College, Ghaziabad

Sub Code	**ROE-081**
Sub. Name	**Digital and Social Media Marketing**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students will develop an understanding of digital and social media marketing practices.	K3
CO2	Students will develop understanding of the social media platforms.	K5
CO3	Students will acquire the skill to acquire and engage consumers online.	K3, K6
CO4	Students will develop understanding of building organizational competency by way of digital marketing practices and cost considerations.	K6
CO5	Students will develop understanding of the latest digital practices for marketing and promotion.	K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1				**3**	**3**		**3**	**1**		**2**		**2**
CO2			**2**	**2**				**1**	**1**		**3**	**2**
CO3					**1**			**2**				**1**
CO4						**2**		**3**	**2**			**2**
CO5								**2**				**2**
Avg			**2**	**2.5**	**2**	**2**	**3**	**1.8**	**1.5**	**2**	**3**	**1.8**

CO-PSO Matrix

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

IMS Engineering College, Ghaziabad

Sub Code	**RCS-080**
Sub. Name	**Machine Learning**

COURSE OUTCOMES		**Bloom's Level**
CO1	Students will be able to apply the fundamental concepts of machine learning, well defined learning problems and its associated algorithms.	K3,K4
CO2	Students will be able to apply and analyse Decision Tree Learning and Artificial Neural network.	K2, K3
CO3	Students will be able to learn the Evaluation of Hypothesis Theory, Bayesian Learning and Bayesian Network.	K2
CO4	Students will be able to understand the concept of Computational Learning Theory and Its associated algorithms.	K5
CO5	Students will be able analyse and apply the concept of Genetic Algorithm and its role in Reinforcement Machine Learning.	K3,K4

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	1	3	1	2	2	1	1	1	1	1
CO2	3	3	2	2	2	2	1	1	1	2	2	1
CO3	2	2	1	1	1	1	1	1	1	1	1	1
CO4	2	2	1	2	1	1	1	1	1	1	1	2
CO5	3	3	2	2	2	2	1	1	1	2	2	1
Avg	**2.6**	**2.6**	**1.4**	**2**	**1.4**	**1.6**	**1.2**	**1**	**1**	**1**	**1.4**	**1.2**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	1	1	1
CO2	2	2	2	1
CO3	2	1	2	1
CO4	2	2	2	2
CO5	3	2	3	2
Avg	**2.4**	**1.6**	**2**	**1.4**

IMS Engineering College, Ghaziabad

Sub Code	**RCS082**
Sub. Name	**IMAGE PROCESSING**

Course Outcome (CO)		**Bloom's Level**
CO1	Explain the basic concepts of two-dimensional signal acquisition, sampling, quantization and color model.	K1, K2
CO2	Apply image processing techniques for image enhancement in both the spatial and frequency domains.	K2, K3
CO3	Apply and compare image restoration techniques in both spatial and frequency domain.	K2, K3
CO4	Compare edge based and region based segmentation algorithms for ROI extraction.	K3, K4
CO5	Explain compression techniques and descriptors for image processing.	K2, K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	1									1
CO2	2	2	2	1								1
CO3	2	3	3	2								2
CO4	1	1	1									1
CO5	2	3	3	2								2
Avg	**1.8**	**2.2**	**2**	**1.67**								**1.4**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1		1	1
CO2	1			
CO3	1	1	1	
CO4	1			
CO5	1	2	1	1
Avg	**1**	**1.5**	**1**	**1**

IMS Engineering College, Ghaziabad

Sub Code	**RCS086**
Sub. Name	**Deep Learning**

COURSE OUTCOMES		**Bloom's Level**
CO1	Learn and Understand the basic concepts of Machine Learning, Linear Models and Neural Networks.	K1, K2
CO2	Understand the fundamentals of deep learning and its various networks.	K2
CO3	Learn and Understand various Dimensionality Reduction Models.	K1, K2
CO4	Analyze and Remember optimization and generalisation models of deep learning.	K1, K4
CO5	Apply knowledge and understanding of deep neural networks for various applications.	K3

CO-PO Matrix

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2		1								3
CO2	3	2	1	1								3
CO3	3	2	2	1								3
CO4	3	3	1	1								3
CO5	2	3	3	3			2					3
Avg	**2.80**	**2.40**	**1.75**	**1.40**			**2**					**3.00**

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1			3	1
CO2			3	1
CO3			3	1
CO4			3	2
CO5		1	1	3
Avg		**1**	**2.60**	**1.60**

IMS Engineering College, Ghaziabad

Sub Code	**RCS 087**
Sub. Name	**Data Compression**

COURSE OUTCOMES		**Bloom's Level**
CO1	Describe the evolution and fundamental concepts of Data Compression and Coding Techniques. .	K1, K2
CO2	Apply and compare different static coding techniques (Huffman & Arithmetic coding) for text compression.	K2, K3
CO3	Apply and compare different dynamic coding techniques (Dictionary Technique) for text compression.	K2, K3
CO4	Evaluate the performance of predictive coding technique for Image Compression.	K2, K3
CO5	Apply and compare different Quantization Techniques for Image Compression.	K2, K3

CO-PO Matrix

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

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1		1	1	2
CO2		2	3	2
CO3		2	1	2
CO4		2	2	2
CO5		2	2	2
Avg		**1.8**	**1.8**	**2**

IMS Engineering College, Ghaziabad

Sub Code	RCS851
Sub. Name	Seminar

COURSE OUTCOMES		Bloom's Level
CO1	Student will be able to Identify, understand, discuss and solve current, real-world issues.	K1, K2
CO2	Student will be able to collaborate with others as they work on intellectual projects.	K2
CO3	Student will be able to speak and debate with an appreciation for complex social, cultural and technical sensibilities.	K3
CO4	Student will be able to increase self-motivation, personal responsibility, and understanding of his or her role in being an informed participant in the educational and organizational process.	K2, K3
CO5	Student will be able to construct a paper consistent with expectations of the discipline, including an appropriate organization, style, voice, and tone.	K3, K4

CO-PO Matrix

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1						1				1
CO2	3	3	2	2	2	2	1	1	1	1	1	3
CO3	3	3	3	3	2		1				1	3
CO4	2	3	2	2	2		1	1	1		2	3
CO5	3	3	3	3	2		1		1		2	3
Avg	**2.60**	**2.60**	**2.50**	**2.50**	**2.00**	**2.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.50**	**2.60**

CO-PSO Matrix

COs	PSO1	PSO2	PSO3	PSO4
CO1	1			1
CO2	3	3	1	3
CO3	2	3	1	3
CO4	3	3	1	3
CO5	3	3	1	3
Avg	**2.40**	**3.00**	**1.00**	**2.60**

IMS Engineering College, Ghaziabad

Sub Code	**RCS 852**
Sub. Name	**Project**

COURSE OUTCOMES		**Bloom's Level**
CO1	The students can effectively collaborate in groups to achieve a common goal.	K2
CO2	Students can improve their capacity to communicate effectively with a diverse group of people.	K3, K5
CO3	Students learn how to design a software or hardware product by learning technical skills, conducting research, and responding ethically.	K1, K3,K4
CO4	The students use what they've learned to create and implement a business plan for an entrepreneurial venture.	K3, K6
CO5	Students build self-learning skills and apply them to lifelong learning.	K3, K6

CO-PO Matrix

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

CO-PSO Matrix

COs	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	2	1	2
CO2	2	3	3	2
CO3	3	3	1	2
CO4	3	3	2	2
CO5	3	3	2	2
Avg	**2.8**	**2.8**	**1.8**	**2**