



IMS Engineering College, Ghaziabad

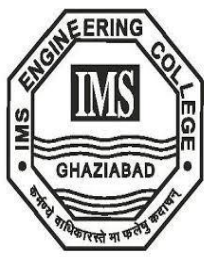
Department of Information Technology

2020-21



IMS Engineering College, Ghaziabad

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



IMS Engineering College, Ghaziabad

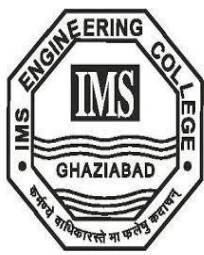
Institute Vision and Mission

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



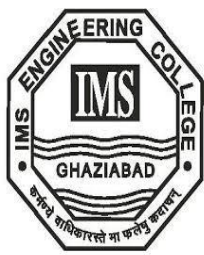
Department Vision and Mission

Vision :

To impart futuristic technical education and establish a department of excellence by preparing students to apply their knowledge and varied skills as a competent technocrat to contribute towards solving complex societal problems and thus building a peaceful and prosperous nation.

Mission:

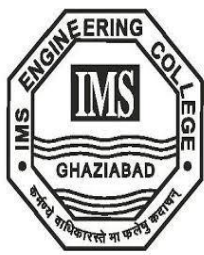
- To impart quality engineering education so that they become perfect IT professional by getting high quality of technical education, research, training, professionalism with strong ethical values.
- To educate students in such a way that they shape up their minds to ensure their productive careers in industry and academia.
- To help students to excel in research and innovation that discovers new knowledge which enables new technologies and systems.
- To prepare students to become an industry ready IT professional by inculcating creativity, team spirit, leadership and ethical competency through industry academia collaboration, continuous curricular, co-curricular and extra-curricular activities.



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

- PEO 1:** Graduates of the program will be able to apply fundamental principles of engineering in problem solving and understanding the role of computing in multiple disciplines.
- PEO 2:** Graduates will learn to apply the various computational techniques and tools for developing solutions & projects in the real world.
- PEO 3:** Graduates will be employed as Information Technology professional beyond entry level positions or be making satisfactory progress in graduate program.
- PEO 4:** Graduates will be able to demonstrate that they can function, communicate, collaborate and continue to learn effectively, and ethically as a socially responsible information technology professional. They will contribute to the society by their professional capabilities through lifelong learning.

Program Specific Outcomes (PSO)

- PSO1: Foundation of computer system:** Ability to understand the principles and working of computer systems.
- PSO2: 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.
- PSO3: Foundation of mathematical concepts:** Ability to apply mathematical methodologies to solve computation task, model real world problem, using appropriate data structure and suitable algorithm.
- PSO4: 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.



IMS Engineering College, Ghaziabad

SEMESTER-III

| Sl. No. | Subject Codes | Subject | Periods | | | EvaluationScheme | | | | EndSemester | | 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/ KVE301 | TechnicalCommunication/UniversalHuman Values | 2 | 1 | 0 | 30 | 20 | 50 | | | 100 | 150 | 3 | |
| | | | 3 | 0 | 0 | | | | | | | | | |
| 3 | KCS301 | DataStructure | 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 CLab | 0 | 0 | 2 | | | | | 25 | | 25 | 50 | 1 |
| 7 | KCS352 | Computer OrganizationLab | 0 | 0 | 2 | | | | | 25 | | 25 | 50 | 1 |
| 8 | KCS353 | Discrete Structure &Logic Lab | 0 | 0 | 2 | | | | | 25 | | 25 | 50 | 1 |
| 9 | KCS354 | Mini Project orInternship Assessment* | 0 | 0 | 2 | | | 50 | | | | 50 | 50 | 1 |
| 10 | KNC301/ KNC302 | Computer System Security/PythonProgramming | 2 | 0 | 0 | 15 | 10 | 25 | | | 50 | | | 0 |



IMS Engineering College, Ghaziabad

SEMESTER-IV

| Sl. No. | Subject Codes | Subject | Periods | | | EvaluationScheme | | | | EndSemester | | 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 | UniversalHuman Values/TechnicalCommunication | 3 | 0 | 0 | 30 | 20 | 50 | | | 100 | 150 | 3 | |
| | | | 2 | 1 | 0 | | | | | | | | | |
| 3 | KCS401 | OperatingSystems | 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 | KIT401 | WebDesigning | 3 | 1 | 0 | 30 | 20 | 50 | | | 100 | 150 | 4 | |
| 6 | KCS451 | Operating SystemsLab | 0 | 0 | 2 | | | | | 25 | | 25 | 50 | 1 |
| 7 | KIT451 | Web DesigningLab | 0 | 0 | 2 | | | | | 25 | | 25 | 50 | 1 |
| 8 | KCS453 | Python Language ProgrammingLab | 0 | 0 | 2 | | | | | 25 | | 25 | 50 | 1 |
| 9 | KNC402/ KNC401 | Python Programming/ Computer SystemSecurity | 2 | 0 | 0 | 15 | 10 | 25 | | | 50 | | 0 | |



IMS Engineering College, Ghaziabad

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|------------------|-------------------------------------|
| Sub Code | KOE-034 |
| Sub. Name | Sensor & Instrumentation |

| COURSE OUTCOMES | | Bloom's 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 | 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 | Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions. | K2 |
| CO3 | Students would imbibe inputs by presentation skills to enhance confidence in face 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 efficiency 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 | 1.20 | 1.60 | 2.80 | 1.00 | 2.20 | 2.25 | 1.67 | 1.75 | 3.00 | 3.00 | 2.00 | 2.60 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | | | | |
| CO2 | | | | |
| CO3 | | | | |
| CO4 | | | | |
| CO5 | | | | |
| CO6 | | | | |
| Avg | | | | |



IMS Engineering College, Ghaziabad

| | |
|------------------|------------------------|
| Sub Code | Data Structures |
| Sub. Name | KCS-301 |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|---|----------------------|
| CO1 | Analyze performance of algorithms and estimate their worst-case and average-case behaviour using asymptotic notations. | K4 |
| CO2 | Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications. | K1 |
| CO3 | Discuss the computational efficiency of the sorting and searching algorithms. | K2 |
| CO4 | Implementation of Trees and Graphs and perform various operations on these data structure. | K3 |
| CO5 | Understanding the concept of recursion, application of recursion and its implementation and removal of recursion. | K2 |
| CO6 | Identify the alternative implementations of data structures with respect to its performance to solve a real-world problem. | K1 |

| CO-PO Matrix | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|------------|-------------|-------------|------------|------------|------------|-------------|-------------|-------------|
| Course Outcome | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 1 | 1 | 2 | | | | | | | | | 1 |
| CO2 | 2 | 2 | 3 | 2 | 1 | 1 | | | | | | 3 |
| CO3 | 2 | 2 | 3 | 2 | 1 | 1 | | | | | | 3 |
| CO4 | 2 | 2 | 3 | 2 | 1 | 1 | | | | | 1 | 3 |
| CO5 | 2 | 2 | 3 | 2 | 1 | 1 | | | | | 1 | 3 |
| CO6 | 2 | 2 | 3 | 2 | 1 | 1 | | | | | 1 | 2 |
| Avg | 1.83 | 1.83 | 2.83 | 2.0 | 1.00 | 1.00 | | | | | 1.00 | 2.5 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 3 | 2 | 1 |
| CO2 | 3 | 3 | 2 | 1 |
| CO3 | 3 | 3 | 2 | 1 |
| CO4 | 3 | 3 | 2 | 1 |
| CO5 | 3 | 3 | 2 | 1 |
| CO6 | 3 | 3 | 2 | 1 |
| Avg | 3.0 | 3.0 | 2.0 | 1.0 |



IMS Engineering College, Ghaziabad

| | |
|------------------|------------------------------|
| Sub Code | KCS-302 |
| Sub. Name | Computer Organization |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|--|----------------------|
| CO1 | Student will be able to study of the basic structure and operation of a digital computer system. | 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. | 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 |

| 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 | 2.80 | 2.80 | 2.60 | 2.40 | 2.00 | 1.00 | 1.00 | | | | | 2.60 |

| 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 | 2.40 | 1.00 | 2.80 | 2.00 |



IMS Engineering College, Ghaziabad

| | |
|------------------|--|
| Sub Code | KCS303 |
| Sub. Name | Discrete Structures and Theory of Logic |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|---|----------------------|
| CO1 | Student would be able to Understand the concepts of Set Theory, Relations, Functions, Natural Numbers. | K2 |
| CO2 | Student would be able to Understand the concept of Groups, Abelian Groups, Rings and Fields. | K2 |
| CO3 | Student would be able to Understand the concept of POSET, Lattices and Boolean Logic. | K2 |
| CO4 | Student would be able to Understand the concepts of Propositional Logic, Predicate Calculus and Quantifiers. | K2 |
| CO5 | Student would be able to Understand the concepts of Graphs, Trees, Recurrence Relation and method to solve the Recurrence Relation using Generating Function and combinatorics. | K2 |

| CO-PO Matrix | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------|
| Course Outcome | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 2 | 2 | 3 | 3 | 3 | | | | | | | 2 |
| CO2 | 2 | 3 | 3 | 3 | 2 | | | | | | | 2 |
| CO3 | 2 | 3 | 3 | 3 | 2 | | | | | | | 2 |
| CO4 | 2 | 3 | 3 | 3 | 2 | | | | | | | 2 |
| CO5 | 3 | 2 | 3 | 3 | 2 | | | | | | | 2 |
| Avg | 2.20 | 2.60 | 3.00 | 3.00 | 2.20 | | | | | | | 2.00 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 2 | 3 | 2 | 1 |
| CO2 | 2 | 3 | 2 | 1 |
| CO3 | 2 | 3 | 2 | 1 |
| CO4 | 2 | 3 | 2 | 1 |
| CO5 | 2 | 2 | 3 | 1 |
| Avg | 2.00 | 2.80 | 2.20 | 1.00 |



IMS Engineering College, Ghaziabad

| | |
|------------------|------------------------------------|
| Sub Code | KCS351 |
| Sub. Name | Data Structures 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 | KCS353 |
| Sub. Name | Discrete Structures and 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 theory, set operations and probability | K3 |
| CO4 | Student would be able to implement classical mathematical problems 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 | Mini Project or Internship Assessment |

| 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 | KNC301 |
| Sub. Name | Computer System Security |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|---|----------------------|
| CO1 | To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats. | K3 |
| CO2 | To discover cyber-attack scenarios to web browsers and web servers and to explain how to mitigate such threats. | 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 |



IMS Engineering College, Ghaziabad

EVEN Sem

| | |
|------------------|--------------------------|
| Sub Code | KCS401 |
| Sub. Name | Operating Systems |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|---|----------------------|
| CO1 | Students will be able to learn functions, structures, classification and history of operating systems. | K2 |
| CO2 | Students will be able to study and apply concepts relating to operating systems, such as concurrency, Process, Threads and deadlocks. | K1, K3 |
| CO3 | Students will be able to demonstrate and evaluate various CPU scheduling Algorithms. | K3 |
| CO4 | Students will be able to acquire knowledge of I/O management techniques and file system organization used in Operating Systems. | K3 |
| CO5 | Students will be able to examine and evaluate Page Replacement, disk scheduling Algorithm | K4, K5 |

| 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 | 1.80 | 1.50 | 1.50 | 1.00 | | | | | | | | 1.60 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 1 | | | 1 |
| CO2 | 1 | 1 | | 1 |
| CO3 | 2 | 2 | | 1 |
| CO4 | 1 | 1 | | 1 |
| CO5 | 1 | | | 1 |
| Avg | 1.20 | 1.33 | | 1.00 |



IMS Engineering College, Ghaziabad

| | |
|------------------|--|
| Sub Code | KCS-402 |
| Sub. Name | Theory of Automata And Formal Languages |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|--|----------------------|
| CO1 | Students will be able to Analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars | K4, K6 |
| CO2 | Students should be able to Analyse and design, Turing machines, formal languages, and grammars | K4, K6 |
| CO3 | Students should be able to Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving. | K2, K3 |
| CO4 | Students should be able to Prove the basic results of the Theory of Computation. | K5 |
| CO5 | Graduate will be able to State and explain the relevance of the Church-Turing thesis. | K2 |

| CO-PO Matrix | | | | | | | | | | | | |
|---------------------|-----|-----|-----|---------|------|-----|-----|-----|-----|------|------|------|
| Course Outcome | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 1 | 1 | | | 1 | | | | | | | 1 |
| CO2 | 1 | 2 | 2 | | | | | | | | | 1 |
| CO3 | 1 | | 1 | 2 | 1 | | | | | | | 1 |
| CO4 | 1 | 2 | 1 | 1 | 1 | | | | | | | 1 |
| CO5 | 1 | 1 | 2 | 2 | 2 | | | | | | | 1 |
| Avg. | 1 | 1.5 | 1.5 | 1.66667 | 1.25 | | | | | | | 1 |

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



IMS Engineering College, Ghaziabad

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|------------------|-----------------|
| Sub Code | KAS402 |
| Sub. Name | Maths IV |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|---|----------------------|
| CO1 | Students will be able to understand how complex analysis is used in the study of air foil for wing design theory and could be able to use analytic functions in finding integration | K2, K4 |
| CO2 | Students will be able to understand the application of integral transform in solving the problems of mechanical vibrations and fluid mechanics. | K2 |
| CO3 | Students will be able to understand how statistical techniques are beneficial in assuring the minimum quality standards through minimum efforts in mammoth productions. | K2 |
| CO4 | Students will be able to understand to solve transcendental equations and solve system of equations numerically | K2 |
| CO5 | Students will be able to understand the application of numerical techniques in solving first order differential equations and find integrations using numerical techniques | K2 |

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

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 2 | 2 | 2 |
| CO3 | 3 | 2 | 3 | 3 |
| CO4 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 3 |
| Average | 2.2 | 2 | 2.4 | 2.6 |



IMS Engineering College, Ghaziabad

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|------------------|------------------------------|
| Sub Code | KCS451 |
| Sub. Name | Operating Systems 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 | 1.00 | 2.00 | 2.00 | 1.00 | | | | | 1.00 | | | 1.00 |

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



IMS Engineering College, Ghaziabad

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|------------------|-------------------------------|
| Sub Code | KCS453 |
| Sub. Name | Python 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 | 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 |



IMS Engineering College, Ghaziabad

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|------------------|----------------------|
| Sub Code | KIT 401 |
| 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. | K1, K2 |
| CO3 | Recognize and apply the elements of Creating Style Sheet (CSS). | K1, K3 |
| CO4 | Understanding the basic concept of Java Script and its application. | K2 |
| CO5 | Introduce basics concept of Web Hosting and apply the concept of SEO | K2 |

| 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 | 2 | 3 | | | | 3 | 3 | 3 | 3 |
| CO5 | 1 | 1 | 3 | 1 | 3 | | | 3 | 3 | 3 | 3 | 3 |
| Avg | 1 | 1 | 2.2 | 1.2 | 3 | | | 3 | 2.6 | 3 | 2.4 | 3 |

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



IMS Engineering College, Ghaziabad

| | |
|------------------|--------------------------|
| Sub Code | KIT 451 |
| Sub. Name | Web Designing Lab |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|--|----------------------|
| CO1 | Understand fundamentals of web development. | K2 |
| CO2 | Understand, analyze and apply the role of scripts/languages like HTML and CSS. | K2, K3, K4 |
| CO3 | Understand, analyze and design the role of JavaScript for dynamic web pages. | K2, K4, K6 |

| CO-PO Matrix | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| Course Outcome | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 1 | 1 | 1 | 1 | 1 | | | | 1 | | | 3 |
| CO2 | 1 | 1 | 1 | 2 | 2 | | | | 1 | 1 | 2 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 2 | | | | 2 | 2 | 3 | 3 |
| Avg | 1.67 | 1.33 | 1.33 | 2.00 | 1.67 | | | | 1.33 | 1.50 | 2.50 | 3.00 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 1 | | |
| CO2 | 3 | 2 | 1 | 1 |
| CO3 | 3 | 3 | 2 | 1 |
| Avg | 3.00 | 2.00 | 1.50 | 1.00 |



IMS Engineering College, Ghaziabad

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

| COURSE OUTCOMES | | Bloom's 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 | 3 | 1 | | | | |
| CO3 | | | 2 | | | 3 | 2 | | 2 | | | |
| CO4 | | | 2 | | | | 2 | 2 | | | | |
| CO5 | | | 2 | 2 | | | 1 | 2 | | | | 2 |
| Avg | | | 2.00 | 2.00 | | 3.00 | 2.00 | 1.67 | 2.00 | | | 2.00 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | | | | 1 |
| CO2 | | | | |
| CO3 | | | | 1 |
| CO4 | | | | 1 |
| CO5 | | | | 2 |
| Avg | | | | 1.25 |



IMS Engineering College, Ghaziabad

| | |
|------------------|---------------------------|
| Sub Code | KNC-402 |
| Sub. Name | Python Programming |

| COURSE OUTCOMES | | Bloom's Level |
|------------------------|--|----------------------|
| CO1 | To read and write simple Python programs | K2 |
| CO2 | To develop Python programs with conditionals and loops | K6 |
| CO3 | To define Python functions and to use Python data structures—lists, tuples, dictionaries | K1 |
| CO4 | To do input/output with files in Python | K3 |
| CO5 | To do searching, sorting and merging in Python | K3 |

| CO-PO Matrix | | | | | | | | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Course Outcome | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | | 3 | 3 |
| CO2 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | | 2 | 3 |
| CO3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | | 3 | 3 |
| Avg | 2.60 | 3.00 | 2.80 | 2.60 | 1.40 | 2.00 | 1.80 | 2.00 | 1.80 | | 2.60 | 3.00 |

| CO-PSO Matrix | | | | |
|----------------------|-------------|-------------|-------------|-------------|
| COs | PSO1 | PSO2 | PSO3 | PSO4 |
| CO1 | 3 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 3 |
| CO3 | 3 | 1 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 3 |
| CO6 | | | | |
| Avg | 3.00 | 2.20 | 2.40 | 2.80 |