## MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CO attainment with Gap Analysis and action taken for July-Dec. 2021 & 1st Year Nov. to Feb. 2022**

| Sem | Faculty Name | Section | Cource code & name | | Course Outcome Statements | CO attainment from Quiz (%age) | CO attainment from Assignment (%age | CO attainment from Mid Sem (%age) Avg. of mid sem I & II | CO attainment from End Sem (%age) | CO direct attainment (%age) | CO direct attainment level | CO indirect attainment (%age) (Calculated using CO f/b, End Sem Seminar, 1 min Paper writing) | CO indirect attainment level | Overall CO attainment | Target (To be set for Overall CO Attainment) | Attained/not attained | Action taken for Not Attained |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| III | Dr. R. K. Gupta | A | 150311-Computer System Organization | CO1 | Recall the basic building blocks of computer Architecture. | 66.36 | 66.36 | 85.71 | 87.2 | 81.6175 | 3 | 88.57 | 3 | 3 | 3 | Attained | - |
| | | | | CO2 | Explain different memories and the functional units of a processor. | 75.75 | 75.75 | 74 | 72 | 73.4375 | 3 | 77.2 | 3 | 3 | 3 | Attained | - |
| | | | | CO3 | Explain the concept of working of microprocessor, multiprocessor and pipelining. | 66.66 | 66.66 | 72 | 79.27 | 74.3 | 3 | 72.77 | 3 | 3 | 3 | Attained | - |
| | | | | CO4 | Analyze various modes of Input-Output data transfer. | 60 | 60 | 59.66 | 76 | 67.915 | 2.8 | 74.1 | 3 | 2.8 | 2.5 | Attained | - |
| | | | | CO5 | Evaluate the arithmetic related to the number system. | 53.03 | 53.03 | 53.8 | 92.8 | 73.1075 | 3 | 80 | 3 | 3 | 3 | Attained | - |
| | | | | CO6 | Develop the skill of writing low level programming. | 67.87 | 67.87 | 69.8 | 72.8 | 70.8175 | 3 | 72.5 | 3 | 3 | 3 | Attained | - |
| III | Dr. Anjula Mehto | B | 150311-Computer System Organization | CO1 | Recall the basic building blocks of computer Architecture. | 69.05 | 72.21 | 72.4 | 68.05 | 69.7825 | 3 | 65.38 | 2.5 | 2.9 | 3 | Not Attained | Remedial classes are conducted and related assignments are given |
| | | | | CO2 | Explain different memories and the functional units of a processor. | 62.4 | 68.12 | 71.2 | 68.51 | 68.37 | 2.8 | 73.56 | 3 | 2.8 | 2.5 | Attained | - |
| | | | | CO3 | Explain the concept of working of microprocessor, multiprocessor and pipelining. | 61 | 65.21 | 62.2 | 68.7 | 65.67625 | 2.6 | 70.11 | 3 | 2.7 | 2.5 | Attained | - |
| | | | | CO4 | Analyze various modes of Input-Output data transfer. | 63.8 | 69.32 | 62.2 | 72.22 | 68.3 | 2.8 | 68.96 | 2.9 | 2.8 | 2.5 | Attained | - |
| | | | | CO5 | Evaluate the arithmetic related to the number system | 60.3 | 75.75 | 68.9 | 80.55 | 74.50625 | 3 | 78.16 | 3 | 3 | 3 | Attained | - |
| | | | | CO6 | Develop the skill of writing low level programming. | 58.6 | 65.51 | 71.2 | 69.4 | 68.01375 | 2.8 | 71.26 | 3 | 2.8 | 2.5 | Attained | - |
| III | Dr. Manish Dixit | A | 150313-Computer Graphics | CO1 | Explain interactive Computer Graphics, various display devices and explore applications of computer graphics. | 60.01 | 77.77 | 80.25 | 80.97 | 77.77 | 3 | 76.34 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO2 | Illustrate various line generations, circle generation, curve generation and shape Generation algorithms. | 56.21 | 78.31 | 62.96 | 83.19 | 74.15 | 3 | 76.34 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO3 | Apply various 2-Dimensional and 3-Dimensional transformations and projections on Images. | 53.69 | 86.11 | 67.85 | 85.14 | 77.0075 | 3 | 75.26 | 3 | 3 | 2.1 | Attained | - |
| | | | | CO4 | Classify methods of image clipping and various algorithms for Line and Polygon clipping. | 64.23 | 87.14 | 65.62 | 70.14 | 70.39625 | 3 | 75.26 | 3 | 3 | 2.1 | Attained | - |
| | | | | CO5 | Choose appropriate filling algorithms, Hidden Surface Elimination algorithm and apply on various images. | 48.63 | 85.65 | 69.42 | 77.6 | 72.94 | 3 | 70.96 | 3 | 3 | 2.3 | Attained | - |
| | | | | CO6 | Discuss various color models, shading methods, animation and Digital Image Processing. | 50.62 | 86.72 | 64.52 | 51.65 | 59.1225 | 1.9 | 66.67 | 2.7 | 2.1 | 2.3 | Not Attained | Extra classes are conducted and related assignments are given |

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| **III** | **Ms. Aishwarya** | **A&B** | **150314-Design and Analysis of Algorithms** | **CO1** | Tell the basic features of an Algorithms. | 84 | 88 | 80 | 78 | 80.5 | 3 | 88 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO2** | Outline major Algorithms and Data Structures. | 81 | 89 | 84 | 81.23 | 82.865 | 3 | 89 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO3** | Apply various algorithmic design paradigms. | 79 | 78 | 76 | 76.07 | 76.66 | 3 | 86 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO4** | Analyze the asymptotic performance of Algorithms. | 71 | 81 | 78 | 75.29 | 76.145 | 3 | 78 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO5** | Compare different design techniques to develop algorithms for computational problems. | 66 | 67 | 74 | 72.11 | 71.18 | 3 | 77 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO6** | Design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach. | 65 | 69 | 74 | 74028 | 37049.25 | 3 | 71 | 3 | 3 | 2.5 | Attained | - |
| **III** | **Ms. Aishwarya** | **A&B** | **150314-Design and Analysis of Algorithm LAB** | **CO1** | Relate the principles of algorithm design in solving problems | - | - | 88 | 81 | 84.5 | 3 | 88 | 3 | 3 | 2.3 | Attained | - |
| | | | | **CO2** | Demonstrate basic algorithms and different problem solving strategies. | - | - | 78 | 75 | 76.5 | 3 | 84 | 3 | 3 | 2.3 | Attained | - |
| | | | | **CO3** | Build creativeness and confidence to solve non-conventional problems. | - | - | 69 | 66 | 67.5 | 2.8 | 86 | 3 | 2.8 | 2.3 | Attained | - |
| | | | | **CO4** | Analyze running times of algorithms using asymptotic analysis. | - | - | 65 | 71 | 68 | 2.8 | 78 | 3 | 2.8 | 2.3 | Attained | - |
| | | | | **CO5** | Compare various algorithm design approaches for solving real world problems. | - | - | 69 | 74 | 71.5 | 3 | 77 | 3 | 3 | 2.3 | Attained | - |
| | | | | **CO6** | Design and implement optimization algorithms in specific applications | - | - | 64 | 62 | 63 | 2.3 | 68 | 2.8 | 2.4 | 2.3 | Attained | - |
| **V** | **Ms. Aishwarya** | **A&B** | **150501-Discrete Structures** | **CO1** | Understand logical notation to define and reason mathematically about the fundamental data types and structures used in computer algorithms and systems. | 84 | 89 | 77 | 71.66 | 76.705 | 3 | 84 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO2** | Outline various mathematical concepts along with their applications. | 81 | 88 | 81.25 | 85.33 | 84.1025 | 3 | 82 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO3** | Implement the applications of various types of graphs to solve real life problem. | 78 | 78 | 74 | 68.5 | 72.25 | 3 | 76 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO4** | Apply the mathematical concepts to solve engineering problems. | 75 | 75 | 84 | 65.4 | 72.45 | 3 | 74 | 3 | 3 | 2.3 | Attained | - |
| | | | | **CO5** | Analyze the set theory, prepositional logic, graph theory, discrete numeric function and algebraic structure to examine the real world problem. | 76 | 79 | 81 | 66 | 72.625 | 3 | 77 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO6** | Design analytical skill and interpret applications of engineering in real time troubleshooting. | 65 | 68 | 75 | 68 | 69.375 | 2.9 | 71 | 3 | 2.9 | 2.3 | Attained | - |
| **V** | **Mr. Mir Shahnawaz Ahmad** | **A&B** | **150502-Software Engineering** | **CO1** | explain the various fundamental concepts of software engineering. | 65.6 | 87 | 83 | 82.5 | 81.075 | 3 | 86.11 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO2** | develop the concepts related to software design & analysis. | 63.6 | 76 | 74 | 77.5 | 74.7 | 3 | 83.33 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO3** | compare the techniques for software project management & estimation. | 58 | 72 | 68 | 93.25 | 79.875 | 3 | 83.33 | 3 | 3 | 2.2 | Attained | - |
| | | | | **CO4** | choose the appropriate model for real life software project. | 61 | 71 | 72 | 52 | 60.5 | 2.1 | 75.6 | 3 | 2.3 | 2.2 | Attained | - |
| | | | | **CO5** | design the software using modem tools and technologies. | 65 | 68 | 64 | 58 | 61.625 | 2.2 | 71 | 3 | 2.4 | 2.1 | Attained | - |
| | | | | **CO6** | test the software through different approaches. | 66 | 76 | 81 | 80 | 78 | 3 | 91.67 | 3 | 3 | 2.5 | Attained | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V | Mr. Mahesh Parmar | A&B | 150503-Theory of Computation | CO1 | explain the basic concepts of switching and finite automata theory & languages. | 60.23 | 82 | 88 | 88 | 83.77875 | 3 | 90 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO2 | relate practical problems to languages, automata, computability and complexity | 65 | 84.33 | 96 | 84 | 84.66625 | 3 | 88.33 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO3 | construct abstract models of computing and check their power to recognize the languages | 70.2 | 73 | 90 | 72 | 76.4 | 3 | 90 | 3 | 3 | 2.2 | Attained | - |
| | | | | CO4 | analyse the grammar, its types, simplification and normal form | 65 | 73 | 92 | 60 | 70.25 | 3 | 73.6 | 3 | 3 | 2.2 | Attained | - |
| | | | | CO5 | interpret rigorously formal mathematical methods to prove properties of languages, grammars and automata. | 62.15 | 66 | 94 | 80 | 79.51875 | 3 | 85 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO6 | develop an overview of how automata theory, languages and computation are applicable in engineering application | 60.23 | 84.33 | 87 | 60 | 69.82 | 3 | 88.33 | 3 | 3 | 2.5 | Attained | - |
| V | Ms. Aishwarya | A&B | 150504-Microprocessor & Interfacing | CO1 | compare the architecture and feature of different 16-bit microprocessor interfacing chips & microcontrollers. | 72 | 84 | 74 | 71.09 | 73.545 | 3 | 84 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO2 | develop programming skills in assembly language of 8086 microprocessor and 8051 microcontroller. | 79 | 89 | 71 | 67.27 | 72.385 | 3 | 85 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO3 | demonstrate the concept of interfacing with peripheral devices. | 81 | 76 | 68 | 74.1 | 73.675 | 3 | 77 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO4 | make use of different interrupts and addressing modes. | 83 | 94 | 72 | 73.3 | 76.775 | 3 | 83 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO5 | design an interfacing for I/O devices. | 75 | 81 | 71 | 69.96 | 72.23 | 3 | 78 | 3 | 3 | 2.3 | Attained | - |
| | | | | CO6 | build a system based on 8086 microprocessor and 8051 microcontroller. | 68 | 75 | 64 | 73.82 | 70.785 | 3 | 67 | 2.7 | 2.9 | 2.3 | Attained | - |
| V | Mr. Mahesh Parmar | A&B | 150503-Theory of Computation LAB | CO1 | Judge various model of computation. | - | - | 54.43 | 70.23 | 62.33 | 2.2 | 89.09 | 3 | 2.4 | 2.1 | Attained | - |
| | | | | CO2 | Construct abstract models of computing. | - | - | 57.29 | 60.43 | 58.86 | 1.9 | 78.03 | 3 | 2.1 | 2.1 | Attained | - |
| | | | | CO3 | Infer the power of abstract models in computing to recognize the languages. | - | - | 65.63 | 73.23 | 69.43 | 2.9 | 90.09 | 3 | 2.9 | 2.1 | Attained | - |
| | | | | CO4 | Demonstrate analytical thinking and intuition for problem solving situations in related areas of theory of computation. | - | - | 72.23 | 58.63 | 65.43 | 2.5 | 87.72 | 3 | 2.6 | 2.1 | Attained | - |
| | | | | CO5 | Explain the limitations of computation in solving problems. | - | - | 57.29 | 73.23 | 65.26 | 2.5 | 90.09 | 3 | 2.6 | 2.1 | Attained | - |
| | | | | CO6 | Define set of rules for syntax verification | - | - | 62.23 | 58.63 | 60.43 | 2 | 78.66 | 3 | 2.2 | 2.1 | Attained | - |
| | Ms. Khushboo | | 150711- | CO1 | define the concept of computer network and various layered architecture. | 70 | 72 | 75 | 78 | 75.5 | 3 | 78 | 3 | 3 | 3 | Attained | - |
| | | | | CO2 | compare the classless and class full addressing of IPV4 . | 68 | 64 | 65 | 76 | 70.75 | 3 | 76 | 3 | 3 | 2.7 | Attained | - |
| | | | | CO3 | identify the different types of networking devices and their functions within a network. | 60 | 60 | 60 | 80 | 70 | 3 | 80 | 3 | 3 | 2.5 | Attained | - |

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| VII | Ms. Khushboo Agrawal | - | Networking with TCP/IP | CO4 | analyze various protocols of computer networks for assisting network design and implementation. | 59 | 55 | 77 | 75 | 71 | 3 | 75 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO5 | design client server applications and communication model and protocols for communication. | 55 | 55 | 80 | 73 | 70.25 | 3 | 73 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO6 | elaborate various TCP/IP protocol for achieving multimedia and security services. | 50 | 53 | 60 | 78 | 66.875 | 2.7 | 78 | 3 | 2.8 | 2.5 | Attained | - |
| VII | Dr. R. K. Gupta | - | 150712-Data Mining & Warehousing | CO1 | classify various databases systems and data models of data warehouse. | 52 | 52 | 74 | 86.4 | 74.7 | 3 | 75.36 | 3 | 3 | 3 | Attained | - |
| | | | | CO2 | compare various methods for storing & retrieving data from different data sources/repository. | 53 | 53 | 66 | 92.8 | 76.15 | 3 | 75.36 | 3 | 3 | 3 | Attained | - |
| | | | | CO3 | apply pre-processing techniques for construction of data warehouse. | 43 | 43 | 66 | 84.8 | 69.65 | 3 | 69.56 | 3 | 3 | 3 | Attained | - |
| | | | | CO4 | analyse data mining for knowledge discovery & prediction. | 33 | 33 | 78.66 | 84.8 | 70.315 | 3 | 72.46 | 3 | 3 | 3 | Attained | - |
| | | | | CO5 | explain data mining methods for identification of association for transactional databases. | 48 | 48 | 68.28 | 88.8 | 73.47 | 3 | 75.36 | 3 | 3 | 3 | Attained | - |
| | | | | CO6 | develop various classification and clustering algorithms for data using data mining. | 34 | 34 | 62.85 | 78.4 | 63.4125 | 2.3 | 69.56 | 3 | 2.4 | 2.4 | Attained | - |
| VII | Dr. Anjula Mehto | - | 150713-Distributed Systems | CO1 | Tell the basic elements and concepts related to distributed system technologies. | 82.2 | 80.12 | 76 | 81.05 | 79.815 | 3 | 81.48 | 3 | 3 | 3 | Attained | - |
| | | | | CO2 | Demonstrate knowledge of the core architectural aspects of distributed systems. | 81.1 | 78.52 | 72.1 | 68.93 | 72.4425 | 3 | 81.48 | 3 | 3 | 3 | Attained | - |
| | | | | CO3 | Identify how the resources in a distributed system are managed by algorithm | 62.7 | 65.23 | 0.68 | 83.62 | 57.97125 | 1.8 | 66.66 | 2.7 | 2 | 2.5 | Not Attained | Extra classes are conducted and related assignments are given |
| | | | | CO4 | Examine the concept of distributed file system and distributed shared memory. | 82 | 86.23 | 81.4 | 78.44 | 80.59875 | 3 | 81.48 | 3 | 3 | 3 | Attained | - |
| | | | | CO5 | Compare various distributed system algorithms for solving real world problems | 50.2 | 60.25 | 62.5 | 75.75 | 67.30625 | 2.7 | 66.66 | 2.7 | 2.7 | 2.5 | Attained | - |
| | | | | CO6 | Develop application for achieving various services of distributed system | 55 | 61.25 | 63.2 | 53.16 | 56.91125 | 1.7 | 77.77 | 3 | 2 | 2.5 | Not Attained | Extra classes are conducted and related assignments are given |
| VII | Ms. Khushboo Agrawal | - | 150701-Internet of Things LAB | CO1 | Understand the key component that make up an IOT system | - | - | 80 | 80 | 80 | 3 | 81.81 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO2 | Explain the defination andusage of the term "Internet of Things" in different context | - | - | 73 | 74 | 73.5 | 3 | 83.33 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO3 | Differentiate between the levels of the IOT stack and be familiar with the key technologies and protocol employed at each layer of the stack | - | - | 70 | 70 | 70 | 3 | 81.81 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO4 | Apply the knowledge and skills acquired during the course to build and test a complete, working IOT system involing prototyping, programing and data analysis | - | - | 70 | 71 | 70.5 | 3 | 89 | 3 | 3 | 2.5 | Attained | - |
| | | | | CO5 | Understand where the IOT concept fit within the broader ICT industry and possible futue trends | - | - | 68 | 72 | 70 | 3 | 78.78 | 3 | 3 | 2.5 | Attained | - |

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| | | | | **CO6** | Appreciate the role of big data, cloud computing and data Nlytics in a typical IoT system | - | - | 70 | 70 | 70 | 3 | 80 | 3 | 3 | 2.5 | Attained | - |
| **VII** | **Mr. Mir Shahnawaz Ahmad** | **-** | **Creative Problem Solving** | **CO1** | Define a Structured Problem Solving Process | - | - | 72.41 | 88.75 | 80.58 | 3 | 85 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO2** | Understand Cause-Effect-Symptom-Problem Relationships in Problem Definition | - | - | 79.46 | 96.79 | 88.125 | 3 | 91 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO3** | Apply Cause-Effect Tools and Techniques and Develop Root-Cause Analysis | - | - | 54.46 | 71.79 | 63.125 | 2.3 | 76 | 3 | 2.4 | 2.1 | Attained | - |
| | | | | **CO4** | Apply Idea Generation Tools and Techniques in Formulating Creative Solutions | - | - | 54.46 | 69.3 | 61.88 | 2.2 | 84 | 3 | 2.4 | 2.1 | Attained | - |
| | | | | **CO5** | Apply Evaluative Tools and Techniques for Decision Making Process | - | - | 57.98 | 74.23 | 66.105 | 2.6 | 74 | 3 | 2.7 | 2.1 | Attained | - |
| | | | | **CO6** | Identify Strategic Considerations in Evaluating Risks and Implementing Solutions | - | - | 72.01 | 88.48 | 80.245 | 3 | 78 | 3 | 3 | 2.1 | Attained | - |
| **I** | **Mr. Mir Shahnawaz Ahmad** | **-** | **230102-Introduction to Computer Programming** | **CO1** | Identify situations where computational methods and computers would be useful. | 81.92 | 82.4 | 80.35 | 79.23 | 80.2425 | 3 | 87.68 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO2** | Describe the basic principles of imperative and structural programming. | 81.92 | 82.4 | 84.7 | 79.23 | 81.33 | 3 | 86.96 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO3** | Develop a pseudo-code and flowchart for a given problem. | 70.16 | 70.16 | 77.58 | 76.07 | 74.97 | 3 | 89.95 | 3 | 3 | 2.1 | Attained | - |
| | | | | **CO4** | Analyze the problems and choose suitable programming techniques to develop solutions. | 81.28 | 81.28 | 78.2 | 92.49 | 86.115 | 3 | 86.23 | 3 | 3 | 2 | Attained | - |
| | | | | **CO5** | Design, implement, debug and test programs. | 69.07 | 71.47 | 74.65 | 72.11 | 72.285 | 3 | 84.78 | 3 | 3 | 2.2 | Attained | - |
| | | | | **CO6** | Design computer programs to solve real world problems. | 75.16 | 79 | 73.66 | 95.58 | 85.475 | 3 | 86.23 | 3 | 3 | 2 | Attained | - |
| **I** | **Mr. Mir Shahnawaz Ahmad** | **-** | **230102-Introduction to Computer Programming LAB** | **CO1** | Identify situations where computational methods and programming would be useful. | 74 | 82 | 84 | 83.33 | 82.165 | 3 | 89 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO2** | implement the basic principles of imperative and structural programming. | 75 | 89 | 79 | 79.55 | 80.025 | 3 | 85.5 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO3** | Develop a pseudo-code and flowchart for a given problem. | 64 | 74 | 75 | 74.2 | 73.1 | 3 | 86.4 | 3 | 3 | 2.5 | Attained | - |
| | | | | **CO4** | Analyze the problems and choose suitable programming techniques to develop solutions. | 61 | 76 | 68 | 67 | 67.625 | 2.8 | 75.6 | 3 | 2.8 | 2.3 | Attained | - |
| | | | | **CO5** | Design, implement, debug and test programs. | 65 | 68 | 66 | 71.58 | 68.915 | 2.9 | 71 | 3 | 2.9 | 2.5 | Attained | - |
| | | | | **CO6** | Design computer programs to solve real world problems. | 62 | 71 | 64 | 60 | 62.625 | 2.3 | 74 | 3 | 2.4 | 2.5 | Not Attained | Additional sessions for discussing, implementing and analysing the skill based mini projects were conducted. |
| **I** | **Mr. Amit Manjwar & Mr. Mahesh Parmar** | **-** | **150111-IT Workshop** | **CO1** | Understand the basic concept and structure of application software | 80.32 | 82.45 | 83.36 | 84.2 | 83.28625 | 3 | 81.81 | 3 | 3 | 3 | Attained | - |
| | | | | **CO2** | Identify the existing configuration of the computers and peripherals. | 80.32 | 87.12 | 74.63 | 80.12 | 79.6475 | 3 | 83.33 | 3 | 3 | 3 | Attained | - |
| | | | | **CO3** | Integrate the PCs into local area network and re-install operating system and various application programs. | 89.31 | 87.12 | 68.75 | 70 | 74.24125 | 3 | 81.81 | 3 | 3 | 3 | Attained | - |

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| | Partial | | | CO4 | Design and develop basic web pages using HTML and CSS. | 69.07 | 70.61 | 75.6 | 79 | 75.86 | 3 | 89 | 3 | 3 | 3 | Attained | - |
| | | | | CO5 | Design & create and implement a static and dynamic webpage | 78.15 | 75.45 | 66 | 67 | 70.23 | 3 | 78.78 | 3 | 3 | 3 | Attained | - |
| | | | | CO6 | Design and implement a program to solve a real world problem. | 77.23 | 69.88 | 68.59 | 69 | 70.03625 | 3 | 80 | 3 | 3 | 3 | Attained | - |

| | xcellent ( | Very Good (2) | Good (1) |
|---|---|---|---|
| **Attainment Levels** | 70 | 60 | 50 |

**Total CO Attainment = 80% of Direct CO Attainment + 20% of Indirect CO Attainment**

**Direct CO Attainment = 12.5% of Weekly Quiz Score + 12.5% of Weekly Assignment Score + 25% of Mid Sem Exam Score + 50% of End Sem Exam Score**

For **Indirect CO attainment:** CO feedback from the students, by respective course instructor, was collected (via Institute's MOODLE), along with the course end seminar and one minutes paper writing.