

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Summary of CO Attainment for Session Jan. - June 2021

Semester	Total No of courses	Total number of COs	Number of COs not attained	Percentage of COs not attained
1st	4	24	0	0
2nd	12	70	1	1.43
4th	4	24	0	0
6th	6	36	0	0
8th	1	6	0	0
Total	27	160	1	0.63

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CO attainment with Gap Analysis and action taken for 1 year Jan. – September 2021

Sem	Course name	Course Outcomes Statements	CO attainment from Quiz (% age)	CO attainment from Assignment (% age)	CO attainment from Mid Sem (%age)	CO attainment from End Sem (%age)	CO direct attainment (%age)	CO direct attainment level	CO indirect attainment (%age)	CO indirect attainment level	Overall CO attainment	Target	Attained/not attained	Action taken for Not Attained
I	230102: Introduction to Computer Programming	identify situations where computational methods and computers would be useful.	78	89	79	76.8	79.025	3	85	3	3	2.3	Attained	-
		describe the basic principles of imperative and structural programming.	88	88	85	86.4	86.45	3	82	3	3	2.5	Attained	-
		develop a pseudo-code and flowchart for a given problem.	83	85	77	80	80.25	3	85	3	3	2.2	Attained	-
		analyze the problems and choose suitable programming techniques to develop solutions.	89	88	76	88	85.125	3	77	3	3	2.3	Attained	-
		design, implement, debug and test programs.	81	81	85	76	79.5	3	74	3	3	2	Attained	-
		design computer programs to solve real world problems.	94	82	74	84.8	82.9	3	76	3	3	2	Attained	-
I	100015: EEES	Describe various energy resources, their conversion to electrical power and role in technological & economic development.	92	98	94	93.6	94.05	3	82	3	3	2.4	Attained	-
		Update with national/international power status and renewable power development targets & missions.	96	88	87	84.8	87.15	3	76	3	3	2.4	Attained	-
		Recognize the impact of pollution on the ecosystem and control policies adopted at national/international levels.	94	85	89	85.6	87.425	3	88	3	3	2.4	Attained	-
		Illustrate the concepts of ecosystems and their conservation.	92	88	88	92.8	90.9	3	79	3	3	2.4	Attained	-
		Solve practical problems of society in a sustainable and ethical manner.	95	89	89	89.6	90.05	3	74	3	3	2.4	Attained	-
		Fulfill professional duties keeping in mind the environmental safety, health, and welfare of public.	93	95	87	89.6	90.05	3	75	3	3	2.2	Attained	-
I	230102: Introduction to Computer Programming LAB	identify situations where computational methods and computers would be useful.	87	78	85	72	77.875	3	85	3	3	2.3	Attained	-
		Implement the basic concepts of imperative and structural programming.	82	76	88	92	87.75	3	82	3	3	2.5	Attained	-
		develop a pseudo-code and flowchart for a given problem.	87	75	87	92	88	3	85	3	3	2.2	Attained	-
		Design and analyze the problems and choose suitable programming techniques to develop solutions.	88	82	85	60	72.5	3	77	3	3	2.3	Attained	-
		design, implement, debug and test programs.	86	81	79	76	78.625	3	74	3	3	2	Attained	-
		design computer programs to solve real world problems.	82	80	72	92	84.25	3	76	3	3	2	Attained	-

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I	IT workshop	To understand the basics of computer Hardware	75	90	75	74	76.375	3	83	3	3	2.1	Attained	-
		To learn networking concepts	86	86	84	84	84.5	3	80	3	3	2.4	Attained	-
		To learn basics html programming concepts	82	85	76	80	79.875	3	83	3	3	2.3	Attained	-
		To understand the principle of web design	88	87	77	88	85.125	3	76	3	3	2	Attained	-
		To develop htmp web pages	82	82	84	75	79	3	73	3	3	2	Attained	-
		To develop the HTMP based website	93	80	73	83	81.375	3	75	3	3	2	Attained	-
II	150211-Data Structures	Outline the basics of algorithms and their performance criteria	84	75	62.67	72	71.5425	3	74	3	3	2.5	Attained	-
		Explain the working of linear/nonlinear data structures	83	74	62.67	76	73.2925	3	75	3	3	2.2	Attained	-
		Identify the appopriate data structures to solve specific problems	87	69	65.33	74	72.8325	3	81	3	3	2.2	Attained	-
		Analyze the performance of various data structures and their applications	88	72	65.33	78	75.3325	3	71	3	3	2.2	Attained	-
		Evaluate time/space complexities of various data structures and their applications	85	75	64	68	70	3	65	2.5	2.9	2.2	Attained	-
		Design optimal algorithmic solution to various problems	86	78	66.67	72	73.1675	3	68	2.8	3	2.2	Attained	-
II	150212-Object oriented Programming & Methodology	tell the concepts of classes and objects and their significance in real world.	86	94	73.6	82	81.9	3	77	3	3	2.3	Attained	-
		explain the benefits of object oriented design.	95	97.58	94.4	84.68	90.0125	3	80	3	3	2.3	Attained	-
		built C++ classes using appropriate encapsulation and design principles.	81	83.5	65.6	84.6	79.2625	3	76	3	3	2.3	Attained	-
		analyse the utilisation of inheritance and polymorphism in the solution of problems.	83	87	73.6	79.8	79.55	3	75	3	3	2.2	Attained	-
		choose appropriate object oriented programming concepts for solving real world problems.	79.5	89	92	72.3	80.2125	3	73	3	3	2.3	Attained	-
		develop solutions to problems demonstrating usage of control structures, modularity, I/O, and other standard language constructs.	84.6	78	83.2	78.6	80.425	3	71	3	3	2.3	Attained	-
	150212-Object	Tell the basic concepts of OOPS	92	82	72	82	80.75	3	86	3	3	2.4	Attained	-
		explain the benefits of OOPS for solving real world problems	84	76	92	87	86.5	3	76	3	3	2.4	Attained	-
		built C++ classes using appropriate encapsulation and design principles.	79	91	92	82	85.25	3	84	3	3	2.4	Attained	-

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II	150212-Object oriented Programming & Methodology LAB	implement inheritance and polymorphism in C++	88	89	60	75	74.625	3	86	3	3	2.4	Attained	-
		choose appropriate object oriented programming concepts for solving real world problems.	82	84	76	82	80.75	3	79	3	3	2.4	Attained	-
		develop solutions to problems demonstrating usage of control structures, modularity, I/O, and other standard language constructs.	78	86	92	81	84	3	73	3	3	2.4	Attained	-
II	150213-Digital Electronics	Explain the computer architecture for defining basic component and functional unit.	87	91	89	81	85	3	75	3	3	2.2	Attained	-
		Recall different number system and solve the basic arithmetic operations.	88	85	88	78	82.625	3	78	3	3	2.2	Attained	-
		Develop the understanding of combinational circuits.	91	90	89	75	82.375	3	81	3	3	2.2	Attained	-
		Analyze the basic concepts of sequential circuits.	89	84	85	71	78.375	3	79	3	3	2.2	Attained	-
		Compare various memories.	91	86	82	76	80.625	3	75	3	3	2.2	Attained	-
		Solve the Boolean functions using logic gates.	92	82	81	79	81.5	3	77	3	3	2.2	Attained	-
II	100016-Technical Language	Speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes.	99		97	96.5	84.875	3	64	2.4	2.9	2.25	Attained	-
		Prepare oral presentations and arguments within the Engineering Profession effectively.	95		95	65.32	68.285	2.8	69.5	3	2.8	2.25	Attained	-
		Demonstrate knowledge and comprehension of major text and traditions in language as well as its social, cultural, and historical context.	95	95	96	75.42	85.46	3	64	2.4	2.9	2.25	Attained	-
		Read a variety of Text analytically so as to demonstrate in writing and/or speech the interpretation of texts.	93.75	98.75	96.25	85.85	91.05	3	70	3	3	2.25	Attained	-
		Interpret text written in English assessing the results in written and oral arguments using appropriate material for support.	97.5	97.5	100	77.1	87.925	3	70.5	3	3	2.25	Attained	-
		Speak clearly effectively and appropriately in a public forum to a variety of audiences and purposes.		80	100	92	81	3	64	2.4	2.9	2.4	Attained	-
		Deliver effectively oral presentations.		80	100	92	81	3	69.5	3	3	2.4	Attained	-

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II	100017-Language Lab	Grasp knowledge and comprehensive skills to speak on a given topic on spot.		62	100	92	78.75	3	64	2.4	2.9	2.4	Attained	-	
		Interpret English spoken by others and respond to situation.		62	100	92	78.75	3	70	3	3	2.4	2.4	Attained	-
		Analyse English Language as spoken by others in day to day life.		80		92	56	1.6	70.5	3	1.9	2.4	2.4	Not Attained	Conducted remedial Classes
II	BASIC COMPUTER ENGINEERING (100023) Branch: ME/AU	Define the fundamentals of computer system.	94	91	83	74	80.875	3	88	3	3	2.5	Attained	-	
		Outline the various components of computer system.	95	94	85	81	85.375	3	86	3	3	2.5	Attained	-	
		Design, implement, test and debug the computer programs using programming language.	84	78	77	71	75	3	79	3	3	2.2	Attained	-	
		Analyze the usage of various system & application softwares to manage computer system and data.	89	87	79	81	82.25	3	84	3	3	2.3	Attained	-	
		Analyze the usage of various system & application softwares to manage computer system and data.	88	88	81	83	83.75	3	88	3	3	2.3	Attained	-	
		Elaborate the working of Internet.	90	88	83	84	85	3	84	3	3	2.3	Attained	-	
II	BASIC COMPUTER ENGINEERING LAB (100023) Branch: ME/AU	Understand the basics of procedural oriented programming	88	84	81	85	84.25	3	86	3	3	2.4	Attained	-	
		Outline the concepts of structured programming	86	87	84	82	83.625	3	87	3	3	2.4	Attained	-	
		Design algorithms and flowcharts for solving problems	79	75	71	74	74	3	85	3	3	2.2	Attained	-	
		Apply the concepts of C/C++ programming to solve real world problems	79	71	68	69	70.25	3	79	3	3	2.2	Attained	-	
		Design, implement, test and debug the computer programs using programming language.	75	68	67	67	68.125	2.8	74	3	2.8	2.2	Attained	-	
		Create basic HTML pages	85	83	72	81	79.5	3	75	3	3	2.2	Attained	-	
II	BASIC COMPUTER ENGINEERING	Define the fundamentals of computer system.	95	93	85	77	83.25	3	82	3	3	2.5	Attained	-	
		Outline the various components of computer system.	94	92	87	80	85	3	84	3	3	2.5	Attained	-	
		Design, implement, test and debug the computer programs using programming language.	87	81	75	68	73.75	3	76	3	3	2.2	Attained	-	

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II	ENGINEERING (100023) Branch: EE	Analyze the usage of various system & application softwares to manage computer system and data.	91	88	76	81	81.875	3	81	3	3	2.3	Attained	-
		Analyze the usage of various system & application softwares to manage computer system and data.	92	87	81	83	84.125	3	84	3	3	2.3	Attained	-
		Elaborate the working of Internet.	90	86	80	80	82	3	78	3	3	2.3	Attained	-
II	BASIC COMPUTER ENGINEERING LAB (100023) Branch: EE	Understand the basics of procedural oriented programming	88	83	84	81	82.875	3	88	3	3	2.4	Attained	-
		Outline the concepts of structured programming	86	88	86	82	84.25	3	84	3	3	2.4	Attained	-
		Design algorithms and flowcharts for solving problems	76	78	70	75	74.25	3	78	3	3	2.2	Attained	-
		Apply the concepts of C/C++ programming to solve real world problems	80	70	71	71	72	3	77	3	3	2.2	Attained	-
		Design, implement, test and debug the computer programs using programming language.	77	69	66	68	68.75	2.9	74	3	2.9	2.2	Attained	-
		Create basic HTML pages	88	80	71	82	79.75	3	82	3	3	2.2	Attained	-
II	BASIC COMPUTER ENGINEERING (100023) Branch: Civil	Define the fundamentals of computer system.	82	88	79	74	78	3	85	3	3	2.5	Attained	-
		Outline the various components of computer system.	84	83	81	83	82.625	3	86	3	3	2.5	Attained	-
		Design, implement, test and debug the computer programs using programming language.	71	69	68	66	67.5	2.8	79	3	2.8	2.2	Attained	-
		Analyze the usage of various system & application softwares to manage computer system and data.	81	83	79	75	77.75	3	81	3	3	2.3	Attained	-
		Analyze the usage of various system & application softwares to manage computer system and data.	82	88	76	73	76.75	3	84	3	3	2.3	Attained	-
		Elaborate the working of Internet.	83	85	78	71	76	3	86	3	3	2.3	Attained	-
	BASIC COMPUTER ENGINEERING	Understand the basics of procedural oriented programming	91	85	83	78	81.75	3	85	3	3	2.4	Attained	-
		Outline the concepts of structured programming	89	86	81	76	80.125	3	86	3	3	2.4	Attained	-
		Design algorithms and flowcharts for solving problems	83	78	75	65	71.375	3	74	3	3	2.2	Attained	-

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II	ENGINEERING LAB (100023) Branch: Civil	Apply the concepts of C/C++ programming to solve real world problems	78	71	73	68	70.875	3	72	3	3	2.2	Attained	-
		Design, implement, test and debug the computer programs using programming language.	75	70	68	64	67.125	2.7	74	3	2.8	2.2	Attained	-
		Create basic HTML pages	79	73	75	68	71.75	3	73	3	3	2.2	Attained	-

Attainment Levels	Excellent (3)	Very Good (2)	Good (1)
	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.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B. Tech. Computer Science & Engineering

CO Attainment, Gap Analysis and Action Taken II to IV Year (Session: Jan. - June 2021 Semester)

Sem	Course Name	Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Level of Total Attainment	Target	Attained/ Not Attained	Action Taken	
IV	150401: Design and Analysis of Algorithm	CO1	Tell the basic features of an Algorithms	93.6	72	89.28	3	2.5	Attained	-
IV		CO2	Demonstrate a familiarity with major Algorithms and Data Structures	95.2	81.3	92.42	3	2.5	Attained	-
IV		CO3	Apply important algorithmic design paradigms and methods of analysis	76.8	69.33	75.306	3	2.5	Attained	-
IV		CO4	Analyze the asymptotic performance of Algorithms	92.8	85	91.24	3	2.5	Attained	-
IV		CO5	Compare different design techniques to develop algorithms for computational problems.	97.6	71	92.28	3	2.5	Attained	-
IV		CO6	Design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach.	96	73	91.4	3	3	Attained	-
IV	150403: Operating system	CO1	Tell the basic concept of operating systems.	96	85.8	93.96	3	2.5	Attained	-
IV		CO2	Explain the working of operating system.	97.6	83.8	94.84	3	2.5	Attained	-
IV		CO3	Develop the solution of various operating system problems/issues.	96.8	81.9	93.82	3	2.5	Attained	-
IV		CO4	Analyze the various operating system problem/issues.	95.2	83.4	92.84	3	2.5	Attained	-
IV		CO5	Measure the performance of various scheduling/allocation approaches.	92.8	84.8	91.2	3	2.5	Attained	-
IV		CO6	Test the working of various scheduling/allocation approaches.	96.8	83.9	94.22	3	3	Attained	-
IV	150404: Computer System Organization	CO1	Recall the basic building blocks of computer Architecture.	100	63.76	92.752	3	3	Attained	-
IV		CO2	Compare different memories.	77.6	66.67	75.414	3	3	Attained	-
IV		CO3	Apply the concept of memory mapping, multiprocessor and pipelining in solving real world problems.	100	55.07	91.014	3	3	Attained	-
IV		CO4	Analyze various modes of Input-Output data transfer.	77.6	63.76	74.832	3	3	Attained	-
IV		CO5	Evaluate the arithmetic related to the number system.	80	63.76	76.752	3	3	Attained	-
IV		CO6	Develop the skill of writing low level programming.	72.8	60.86	70.412	3	3	Attained	-
IV	100004: Cyber Security	CO1	Tell the basic terminologies of cyber security	97.6	85	95.08	3	3	Attained	-
IV		CO2	Explain the basic concepts of Networking and Internet	97.6	83.4	94.76	3	3	Attained	-
IV		CO3	Apply various methods used to protect data in the internet environment in real world situations	99.2	82.4	95.84	3	3	Attained	-
IV		CO4	Discover the Concepts of IP security and Architecture	96	80.6	92.92	3	3	Attained	-

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B. Tech. Computer Science & Engineering

CO Attainment, Gap Analysis and Action Taken II to IV Year (Session: Jan. - June 2021 Semester)

Sem	Course Name	Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Level of Total Attainment	Target	Attained/ Not Attained	Action Taken	
IV	Security	CO5	Compare various types of Cyber Security Threats/ Vulnerabilities	96.8	84.4	94.32	3	3	Attained	-
IV		CO6	Develop the understanding of Cyber Crime Investigation and IT Act 2000.	97.6	80	94.08	3	3	Attained	-
VI	150602: Computer Networks	CO1	Explain the fundamental concepts of Computer Networks.	95.2	90.4	94.24	3	3	Attained	-
VI		CO2	Illustrate the basic taxonomy & terminologies of computer network protocols.	96	89.6	94.72	3	3	Attained	-
VI		CO3	Develop a concept for understanding advance computer network.	99.2	88	96.96	3	3	Attained	-
VI		CO4	Build the skill of IP addressing and routing mechanism.	99.2	88	96.96	3	3	Attained	-
VI		CO5	Predict the performance of computer network in congestion and Internet.	96	85.6	93.92	3	3	Attained	-
VI		CO6	Construct the network environment for implementation of computer networking concept	96.8	85.6	94.56	3	3	Attained	-
VI	150611: Network & Web Security	CO1	explain cryptographic algorithms, hash algorithms and authentication mechanisms	100	36.57	87.314	3	2.5	Attained	-
VI		CO2	illustrate fundamentals of number theory, attacks and security principles.	99.2	35.64	86.488	3	2.5	Attained	-
VI		CO3	apply number theory and various algorithms to achieve principles of security.	98.4	32.4	85.2	3	2.5	Attained	-
VI		CO4	analyse the cause for various existing network attacks and describe the working of available security controls.	100	32.4	86.48	3	2.5	Attained	-
VI		CO5	examine the vulnerabilities in IT infrastructure.	99.2	31.48	85.656	3	3	Attained	-
VI		CO6	predict the attacks and controls associated with IP, transport-level, web and e-mail security.	100	32.4	86.48	3	2.5	Attained	-
VI	150601:	CO1	Outline the major concept areas of language translation and compiler design and acquire the knowledge of modern compiler & its features.	84.3	88	85.04	3	3	Attained	-
VI		CO2	Identify the similarities and differences among various parsing techniques and grammar transformation techniques	83.6	90	84.88	3	3	Attained	-
VI		CO3	Apply the knowledge of lex tool & yacc tool to develop a scanner & parser and apply ideas and techniques discussed to various software designs.	80	87	81.4	3	3	Attained	-

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VI	Compiler Design	CO4	Implement various parsing, conversion, optimization and code generation algorithms for the design of a compiler	78	82	78.8	3	3	Attained	-
VI		CO5	Develop program to solve complex problems in compiler and learn the new code optimization techniques to improve the performance of a program in terms of speed & space	82	78	81.2	3	3	Attained	-
VI		CO6	Analyze the problems and limitations of modern compiler and learn & use the new tools and technologies used for designing a compiler.	76	80	76.8	3	3	Attained	-
VI	100007: Disaster Management	CO1	Identify disaster prevention and mitigation approaches	86.4	88	86.72	3	3	Attained	-
VI		CO2	Classify global and national disaster, their trends and profiles	84.8	85	84.84	3	3	Attained	-
VI		CO3	determine impact of various disaster	80	87	81.4	3	3	Attained	-
VI		CO4	Apply disaster risk reduction in management	87.2	80	85.76	3	3	Attained	-
VI		CO5	Infer the linkage between disaster, environment and management	81.6	85	82.28	3	3	Attained	-
VI	150606: Minor Project	CO1	Able to solve real world problem	88	86	87.6	3	3	Attained	-
VI		CO2	Explain and Recognize the Conduction of project planning activities.	86	84	85.6	3	3	Attained	-
VI		CO3	Utilize new tools , techniques, methodologies etc.	76	90	78.8	3	3	Attained	-
VI		CO4	Analyze effective project execution and control techniques that result in successful projects.	84	87	84.6	3	3	Attained	-
VI		CO5	Use software development model	85	86	85.2	3	3	Attained	-
VI		CO6	Discuss the working of projects	82	76	80.8	3	3	Attained	-
VI	150601: Compiler Design LAB	CO1	Generate the machine code by considering all the functionalities involved in different phases of the compilation process	85	90	86	3	3	Attained	-
VI		CO2	Demonstrate the knowledge of patterns, tokens & regular expressions in programming for solving a problem	78	89	80.2	3	3	Attained	-
VI		CO3	Operate different types of compiler tools to meet the requirements of the realistic constraints of compilers.	86	87.5	86.3	3	3	Attained	-
VI		CO4	Design and Implement the parsing techniques including Bottom-up and Top-down parsing.	88	82	86.8	3	3	Attained	-

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B. Tech. Computer Science & Engineering

CO Attainment, Gap Analysis and Action Taken II to IV Year (Session: Jan. - June 2021 Semester)

Sem	Course Name	Course outcomes	CO Direct Attainment %	CO Indirect Attainment %	Total Attainment %	Level of Total Attainment	Target	Attained/ Not Attained	Action Taken	
VI		CO5	Develop program for implementing code optimization techniques and apply it to improve the performance of a program.	81	81.3	81.06	3	3	Attained	-
VI		CO6	Build symbol table and intermediate code.	76	80	76.8	3	3	Attained	-
VIII	Internship/ Project	CO1	Design solutions to real world problems	85	89	85.8	3	3	Attained	-
VIII		CO2	Express the technical ideas, strategies and methodologies	88	85	87.4	3	3	Attained	-
VIII		CO3	Utilize new tools, algorithms, techniques to obtain solution of the project	78	91	80.6	3	3	Attained	-
VIII		CO4	Evaluate the performance of the prototype/ results	81	87	82.2	3	3	Attained	-
VIII		CO5	Able to locate and use technical information from multiple sources.	83	88	84	3	3	Attained	-
VIII		CO6	Demonstrate the ability to communicate effectively in speech and writing	86	78	84.4	3	3	Attained	-

Attainment Levels	Excellent (3)	Very Good (2)	Good (1)
	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.