## **Department of Engineering Mathematics and Computing**

CO's Attainments (Jan. – June 2023)

## MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)

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Subject & Code	CO's	Description of CO's							
	CO1	Understand the theory and architecture of central processing unit.							
Computer	CO2	Define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation							
Organization and Logic Design &	CO3	Use appropriate tools to design verify and test the CPU architecture.							
250221	CO4	Learn the concepts of parallel processing, pipelining and inter processor communication.							
	CO5	Exemplify in a better way the I/O and memory organization							
	CO1	Determine the analytic solution of ordinary differential equations							
	CO2	Interpret the solution of ordinary differential equations with constant and variable coefficients							
Differential Equations & 250222	CO3	Acquire the knowledge of second and higher order differential equation							
	CO4	Formulate the Partial differential equations							
	CO5	Evaluate the Partial differential equations of higher order with its application							
	CO1	Tell the concepts of classes & objects and their significance in real world.							
Object Oriented Methodology and Programming with C++ & 250223	CO2	Explain the benefits of object oriented design.							
	CO3	Build C++ classes using appropriate features of object oriented programming							
	CO4	Analyze the utilization of inheritance and polymorphism in the solution of problems.							
	CO5	Apply object orient programming concepts for real world problem.							
	CO1	Determine the solution of Matrix							
	CO2	Find the analytical solution of algebraic structures'							
Linear Algebra & 250224	CO3	Express the vector space							
	CO4	Acquire the knowledge of Linear transformation							
	CO5	Illustrate the concept of Inner product spaces							
	CO1	Acquire the knowledge Simulation							
	CO2	Analyze the discrete and continuous Simulation Models							
Simulation Modeling and Analysis &	CO3	Evaluate the hypothetical parameters							
250225	CO4	Interpret the model building							
	CO5	Determine the input output of system simulation							
Transform and	CO1	Apply Fourier series and Fourier transform to complex mathematical problems							
Vector Calculus & 250401	CO2	Analyse differential equations using Laplace transform							
250401	CO3	Illustrate the problems of Z- transform & difference equations							

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	CO4	Deconstruct computational problems using wavelet analysis.						
	CO5	Apply vector calculus to determine solutions of complex problem						
	CO1	Describe the DBMS approach.						
Database	CO2	Apply Relational algebra concepts to design database system.						
Management Systems and SQL &	CO3	Explain functional dependencies and normalization techniques						
250402	CO4	Evaluate the methods of transaction, concurrency and recovery.						
	CO5	Apply DBMS techniques to solve real time problem.						
	CO1	Identify problems related to languages, automata, computability and complexity.						
Theory of	CO2	Explain the basic concepts of finite automata theory & languages.						
Theory of Computation &	CO3	Analyse the grammar, its types, simplification and normal form.						
250403	CO4	Recognize the concept of Push down automata						
	CO5	Construct abstract models of computing and check their power to recognize the languages.						
	CO1	Identify the basic properties of algorithm.						
Design and Amelanta	CO2	Analyze the complexity of an algorithm.						
of Algorithms &	CO3	Apply mathematical preliminaries to analyze and design stages of different types of algorithms.						
250404	CO4	Evaluate algorithms for a number of important computational problems.						
	CO5	Compare design techniques for algorithm development.						
	CO1	Outline the properties of number theory and transcendental numbers						
Number Theory and	CO2	Describe the divisibility and related algorithms, factorization and quadratic sieve, efficiency of other factoring algorithms.						
Cryptography & 250405	CO3	Determine arithmetical functions, Distribution of primes and Diophantine equations						
	CO4	Recognize basics of cryptography techniques						
	CO5	Evaluate the Public key cryptosystems						

	CO1	Explain interactive Computer Graphics, various display devices and explore applications of computer graphics.
	CO2	Illustrate various line generations, circle generation, curve generation and shape Generation algorithms.
Computer Graphics & 250601	CO3	Apply various 2-Dimensional and 3-Dimensional transformations and projections on Images.
	CO4	Classify methods of image clipping and various algorithms for Line and Polygon clipping.
	CO5	Choose appropriate filling algorithms, Hidden Surface Elimination algorithm and apply on various images.
	CO6	Discuss various color models, shading methods, animation and Digital Image Processing.

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	CO1	Define the concepts of finite automata and context free grammar					
	CO2	Build the concept of working of compiler					
Compiler Design & 250602	CO3	Examine various parsing techniques and their comparison.					
	CO4	Compare various code generation and code optimization techniques.					
	CO5	Analyse different tools and techniques for designing a compiler					
	CO1	Define basic concepts of Artificial Intelligence & Machine Learning.					
	CO2	Illustrate various techniques for search and processing.					
Artificial Intelligence &	CO3	Identify various types of machine learning problems and techniques.					
Machine Learning	CO4	Analysis various techniques in Artificial Intelligence, ANN & Machine Learning.					
AI & WILJ & 250004	CO5	Apply AI and ML techniques to solve real world problems.					
	CO6:	Build AI enabled intelligent systems for solving real world problems.					

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Dr. J. K. Muthele (OBE- Coordinator)

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Dr. Vikas Shinde (Professor and Head)

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### Department of Engineering Mathematics & Computing Co Attainment & Gap Analysis

Jan. – June- 2023

	de	5	CO Attainment %			С	O Attain	ment %		Result		CO Attainment		
Name of Faculty	Course Name & Co	Course Outcome:	l- Mid Term	II- Mid Term	End Sem Exam	Direct	InDirect	Overall	Target	Gap in Attainment %	Registered Students	SSAq	Status	Action Taken
war	ature	CO-1	61.25		91.38	76.32	84.00	77.85	70.00	-7.85			Attained	
Shej	hited ation 1)	CO-2	61.92		90.22	76.07	73.00	75.45	70.00	-5.45			Attained	
/ek	- Arc ganiz 5022	CO-3		74.86	77.84	76.35	74.00	75.88	70.00	-5.88			Attained	
Viv	Viv Duter Org	CO-4		70.83	74.22	72.53	65.00	71.02	70.00	-1.02			Attained	
Prof	ComJ &	CO-5		77.22	86.71	81.97	62.00	77.97	70.00	-7.97			Attained	
de		CO-1	61.33		91.38	76.36	61.00	73.29	65.00	-8.29			Attained	
Shin	ntial ons 22)	CO-2	60.08		90.22	75.15	59.00	71.92	65.00	-6.92			Attained	
kas .	eren Latio	CO-3		59.79	77.84	68.82	57.00	66.45	65.00	-1.45			Attained	
: Vi	Diff Equ	CO-4		62.92	74.22	68.57	63.00	67.45	65.00	-2.45			Attained	
$D_{I}$		CO-5		64.38	86.71	75.54	60.00	72.43	65.00	-7.43			Attained	
	ا d th	CO-1	63.03		91.38	77.20	70.00	75.76	70.00	-5.76			Attained	
rma	nted / an ( wii 23)	CO-2	75.00		90.22	82.61	65.00	79.09	70.00	-9.09			Attained	
Sha	Drie logy ning	CO-3		69.10	77.84	73.47	60.00	70.78	70.00	-0.78			Attained	
Prof. P.	Object ( Aethodo rogramn C++ (2)	CO-4		62.50	74.22	68.36	64.00	67.49	70.00	2.51			Not Attained	Doubt Clearing Session to be arranged in Extra Hours To Organize the Remedial Classes, .Give Assignments
	- ~ <u>~</u>	CO-5		61.18	86.71	73.94	65.00	72.16	70.00	-2.16			Attained	

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edi		CO-1	73.06		91.38	82.22	69.00	79.57	65.00	-14.57		Attained	
turva	bra	CO-2	66.72		90.22	78.47	67.00	76.18	65.00	-11.18		Attained	
ivya Chai	lear Alge (250224)	CO-3		52.38	77.84	65.11	57.00	63.49	65.00	1.51		Not Attained	Doubt Clearing Session to be arranged in Extra Hours To Organize the Remedial Classes, Give Assignments
$D^{i}$	Lir	CO-4		65.69	74.22	69.96	66.00	69.17	65.00	-4.17		Attained	
$D^{\prime}$		CO-5		62.70	86.71	74.70	64.00	72.56	65.00	-7.56		Attained	
x	K. Ray ation 1g and 250225)	CO-1	67.06		91.38	79.22	62.00	75.77	60.00	-15.77		Attained	
Ra		CO-2	55.31		90.22	72.76	65.00	71.21	60.00	-11.21		Attained	
A. K.	nulat eling is (2	CO-3		51.39	77.84	64.62	55.00	62.69	60.00	-2.69		Attained	
Dr. ∕	Sin Aod alys	CO-4		71.94	74.22	73.08	60.00	70.47	60.00	-10.47		Attained	
Ι	An An	CO-5		79.86	86.71	83.28	61.00	78.83	60.00	-18.83		Attained	
-	d us	CO-1	71.00		84.76	77.88	84.76	79.26	60.00	-19.26		Attained	
Jair	Jain n and lcult	CO-2	63.59		92.06	77.83	92.06	80.67	60.00	-20.67		Attained	
).K.	forr r Ca 5040	CO-3		68.40	75.90	72.15	75.90	72.90	60.00	-12.90		Attained	
Dr. I	Dr. D rans ectoi	CO-4		63.82	70.83	67.32	70.83	68.02	60.00	-8.02		Attained	
Ι	T V	CO-5		66.39	83.37	74.88	83.37	76.58	60.00	-16.58		Attained	
ıa	L. q	CO-1	72.53		91.38	81.95	76.00	80.76	60.00	-20.76		Attained	
narn	e an nent SQ	CO-2	74.00		90.22	82.11	74.00	80.49	60.00	-20.49		Attained	
S. SI	Base ager n & 5040	CO-3		76.67	77.84	77.26	69.00	75.60	60.00	-15.60		Attained	
of. ]	ata Man yster (2;	CO-4		71.43	74.22	72.82	68.00	71.86	60.00	-11.86		Attained	
Pr	Ω <sup>r</sup> S.	CO-5		75.00	86.71	80.85	61.00	76.88	60.00	-16.88		Attained	
		CO-1	49.22		91.38	70.30	70.00	70.24	60.00	-10.24		Attained	
vek aa	of tion 3)	CO-2	54.00		90.22	72.11	71.00	71.89	60.00	-11.89		Attained	
. Vi	eory puta 5040	CO-3		77.93	77.84	77.89	59.00	74.11	60.00	-14.11		Attained	
Рrof	Com (25	CO-4		83.19	74.22	78.71	59.00	74.77	60.00	-14.77		Attained	
_		CO-5		71.67	86.71	79.19	64.00	76.15	60.00	-16.15		Attained	
lish	& s of 4)	CO-1	69.44		91.38	80.41	59.00	76.13	60.00	-16.13		Attained	
Ash Soni	sign llysis corith 5040	CO-2	68.44		90.22	79.33	60.00	75.46	60.00	-15.46		Attained	
Ū.	Dr. A S( Desi Desi Analy Algo (250)	CO-3		65.63	77.84	71.73	61.00	69.59	60.00	-9.59		Attained	

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		CO-4		69.69	74.22	71.96	62.00	69.96	60.00	-9.96		Attained	
		CO-5		71.94	86.71	79.33	61.00	75.66	60.00	-15.66		Attained	
su	and	CO-1	73.03		91.38	82.20	64.00	78.56	65.00	-13.56		Attained	
Ö	ory i aphy 5)	CO-2	74.22		90.22	82.22	69.00	79.58	65.00	-14.58		Attained	
S.	The togra	CO-3		73.96	77.84	75.90	54.00	71.52	65.00	-6.52		Attained	
of. A	nber Cryp (25	CO-4		68.55	74.22	71.39	63.00	69.71	65.00	-4.71		Attained	
P <sub>2</sub>	Nur	CO-5		77.64	86.71	82.17	61.00	77.94	65.00	-12.94		Attained	
nu	ics	CO-1	74.75		82.66	78.71	71.00	77.17	55.00	-22.17		Attained	
a Ve	raph 1)	CO-2	65.86		92.39	79.12	73.00	77.90	55.00	-22.90		Attained	
kal	er G	CO-3		71.88	74.29	73.08	74.00	73.27	55.00	-18.27		Attained	
Noc	nput (25	CO-4		65.63	79.87	72.75	65.00	71.20	55.00	-16.20		Attained	
Ľ.	Coi	CO-5		89.17	83.37	86.27	62.00	81.41	55.00	-26.41		Attained	
							1						Doubt Clearing Session to be arranged
uma	lgn	CO-1	61.62		79.12	70.37	71.00	70.50	75.00	4.50		Attained	in Extra Hours Remedial Classes,
Sharma	Design 02)	CO-1 CO-2	61.62 87.50		79.12 91.33	70.37 89.41	71.00 73.00	70.50 86.13	75.00 75.00	4.50 -11.13	-	Attained Attained	in Extra Hours Remedial Classes,
ivek Sharma	iler Design 50602)	CO-1 CO-2 CO-3	61.62 87.50	77.08	79.12 91.33 74.78	70.37 89.41 75.93	71.00 73.00 74.00	70.50 86.13 75.55	75.00 75.00 75.00	4.50 -11.13 -0.55	-	Attained Attained Attained	in Extra Hours Remedial Classes,
rof. Vivek Sharma	Compiler Design (250602)	CO-1 CO-2 CO-3 CO-4	61.62 87.50	77.08	79.12 91.33 74.78 64.28	70.37 89.41 75.93 70.16	71.00 73.00 74.00 65.00	70.50 86.13 75.55 69.13	75.00 75.00 75.00 75.00	4.50 -11.13 -0.55 5.87	-	Not Attained Attained Attained Not Attained	To Organize the Remedial Classes, Give Assignments
Prof. Vivek Sharma	Compiler Design (250602)	CO-1 CO-2 CO-3 CO-4 CO-5	61.62 87.50	77.08 76.04 88.89	79.12 91.33 74.78 64.28 83.97	70.37 89.41 75.93 70.16 86.43	71.00 73.00 74.00 65.00 62.00	70.50 86.13 75.55 69.13 81.54	75.00 75.00 75.00 75.00 75.00	4.50 -11.13 -0.55 5.87 -6.54	-	Not Attained Attained Attained Not Attained	To Organize the Remedial Classes, Give Assignments
Prof. Vivek Sharma	2 Compiler Design ing (250602) 604	CO-1 CO-2 CO-3 CO-4 CO-5 CO-1	61.62 87.50 87.50	77.08 76.04 88.89	79.12 91.33 74.78 64.28 83.97 78.50	70.37 89.41 75.93 70.16 86.43 79.75	71.00 73.00 74.00 65.00 62.00 71.00	70.50 86.13 75.55 69.13 81.54 78.00	75.00 75.00 75.00 75.00 75.00 70.00	4.50 -11.13 -0.55 5.87 -6.54 -8.00	-	Not Attained Attained Attained Attained Attained	To Organize the Remedial Classes, Give Assignments
Ray Prof. Vivek Sharma	ial Compiler Design ce & Compiler Design 250604 (250602)	CO-1 CO-2 CO-3 CO-4 CO-5 CO-1 CO-2	61.62 87.50 87.50 81.00 72.81	77.08 76.04 88.89	79.12 91.33 74.78 64.28 83.97 78.50 93.24	70.37 89.41 75.93 70.16 86.43 79.75 83.02	71.00 73.00 74.00 65.00 62.00 71.00 73.00	70.50 86.13 75.55 69.13 81.54 78.00 81.02	75.00 75.00 75.00 75.00 75.00 70.00	4.50 -11.13 -0.55 5.87 -6.54 -8.00 -11.02	-	Not Attained Attained Attained Attained Attained Attained	To Organize the Remedial Classes, Give Assignments
. K. Ray Prof. Vivek Sharma	tificial igence & Compiler Design te Learning (250602) AL) 250604	CO-1 CO-2 CO-3 CO-4 CO-5 CO-1 CO-2 CO-3	61.62 87.50 81.00 72.81	77.08 76.04 88.89 76.75	79.12 91.33 74.78 64.28 83.97 78.50 93.24 76.86	70.37 89.41 75.93 70.16 86.43 79.75 83.02 76.80	71.00 73.00 74.00 65.00 62.00 71.00 73.00 74.00	70.50 86.13 75.55 69.13 81.54 78.00 81.02 76.24	75.00 75.00 75.00 75.00 75.00 70.00 70.00	4.50 -11.13 -0.55 5.87 -6.54 -8.00 -11.02 -6.24	-	Not Attained Attained Attained Attained Attained Attained Attained	To Organize the Remedial Classes, Give Assignments
Jr. A. K. Ray Prof. Vivek Sharma	Artificialatelligence &chine Learning& ML) 250604	CO-1 CO-2 CO-3 CO-4 CO-5 CO-1 CO-2 CO-3 CO-4	61.62 87.50 81.00 72.81	77.08 76.04 88.89 76.75 76.75	79.12 91.33 74.78 64.28 83.97 78.50 93.24 76.86 81.84	70.37 89.41 75.93 70.16 86.43 79.75 83.02 76.80 79.88	71.00 73.00 74.00 65.00 62.00 71.00 73.00 74.00 65.00	70.50 86.13 75.55 69.13 81.54 78.00 81.02 76.24 76.91	75.00 75.00 75.00 75.00 75.00 70.00 70.00 70.00	4.50 -11.13 -0.55 5.87 -6.54 -8.00 -11.02 -6.24 -6.91	-	Not Attained Attained Attained Attained Attained Attained Attained Attained	To Organize the Remedial Classes, Give Assignments
Dr. A. K. Ray Prof. Vivek Sharma	ArtificialIntelligence &Machine Learning(250602)	CO-1 CO-2 CO-3 CO-4 CO-5 CO-1 CO-2 CO-3 CO-4 CO-4	61.62 87.50 81.00 72.81	77.08 76.04 88.89 76.75 76.75 77.93 83.19	79.12 91.33 74.78 64.28 83.97 78.50 93.24 76.86 81.84 84.38	<ul> <li>70.37</li> <li>89.41</li> <li>75.93</li> <li>70.16</li> <li>86.43</li> <li>79.75</li> <li>83.02</li> <li>76.80</li> <li>79.88</li> <li>83.79</li> </ul>	71.00 73.00 74.00 65.00 62.00 71.00 73.00 74.00 65.00 62.00	70.50 86.13 75.55 69.13 81.54 78.00 81.02 76.24 76.91 79.43	75.00         75.00         75.00         75.00         75.00         75.00         75.00         70.00         70.00         70.00         70.00         70.00         70.00         70.00	4.50 -11.13 -0.55 5.87 -6.54 -8.00 -11.02 -6.24 -6.91 -9.43	-	Not Attained Attained Not Attained Attained Attained Attained Attained Attained	To Organize the Remedial Classes, Give Assignments

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### **Department of Engineering Mathematics & Computing**

### Action Taken Report Based on Course Outcomes (CO's) (MAC- II, VI & VI Sem.) Jan. – June- 2023

- More assignment & tutorial classes should be conducted
- To support the CO, more numerical questions should be solved in tutorial classes
- Animations and videos are planned to demonstrate clear understanding
- If necessary, additional classes to be conducted
- More questions through assignments
- Provide various numerical problems through tutorial sheet
- More tutorials including algebra application to signals
- More tutorial including conceptual numerical problems through tutorial sheet should be given.
- Practical exposer through industrial visit, problem solving should be included to creating interest
- More numerical and tutorials are planned in the class
- Numerical on Circuit design problems and limitation
- Provide more numerical problems and assignments to the students
- Extra time will be given on this topic
- Variety of assignments and MCQs
- Animated video lectures may be demonstrated
- More interaction with the students

Dr. Vikas Shinde (Professor and Head)