8.1.2 Actions Taken Based on the Results of Evaluation of the POs/PSOs Attainment

PVP-20 REGULATION-20 Admitted Batch															
PO & PSO -DA ATTAINMENTS															
S.No	COURSE CODE	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	**20HS1101**	Communicative English I									2.41	2.42		2.46		
2	**20BS1101**	Calculus and Linear Algebra	2.61	2.2							2.61	2.61			2.45	2.5
3	**20BS1103**	Engineering Physics	2.13	2.11							2.86	2.86		2.86		
4	**20ES1101**	Basic Electrical & Electronics Engineering	2.13	1.93		3					3	3			2.22	2.22
5	**20ES1103**	Problem Solving Techniques	2.11	2.11							2.11	2.07			2.12	
6	**20HS1151**	Communicative English I Lab									2.49	2.49		2.49		
7	**20BS1152**	Engineering Physics Lab	2.29			2.29								2.29		
8	**20ES1151**	Basic Electrical & Electronics Engineering Lab	2.16	2		2.1	2.21				2.21	2.16			2.19	2.2
9	**20HS1201**	Communicative English II									2.46	2.46		2.46		
10	**20BS1202**	Engineering Chemistry	2.33						2.33			2.98		2.33	2.33	
11	**20BS1204**	Probability and Statistics	2.54	2.2							2.54	2.54			2.46	2.5
12	**20ES1202**	Programming for Problem Solving	2	2								2.14		2.06	2.06	

S.No	COURSE CODE	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
13	**20ES1204**	Engineering Graphics	2.13	2.1			2.26				2.13	2.13	2.13		2.26	
14	**20HS1251**	Communicative English II Lab									2.49	2.49		2.49		
15	**20BS1251**	Engineering Chemistry Lab	3		3.00				3			3			3	
16	**20ES1253**	Programming for Problem Solving Lab	2.48		1.69		2.21				2.21	2.74			2.11	
17	**20MC1201**	Life Sciences for Engineers	1.8				1.9	2				2				1.9
18	**20BS1303**	Discrete Mathematical Structures	1.91	2.3							2.34	2.32			2.47	
19	**20CS3301**	Fundamentals of Digital Logic Design	1.93	2							2.04	2.03			2.13	
20	**20CS3302**	Object Oriented Programming through C++	2.15	2.2							2.22	2.25		2.22	2.39	
21	**20CS3303**	Computer Organization and Architecture	2.05	1.98							1.95	1.95			1.96	
22	**20ES1305**	Data Structures	1.78	2							2	1.98		1.8	1.8	
23	**20CS3351**	Object Oriented Programming through C++ Lab	2.8		2.37		2.93				2.93	2.9			2.93	
24	**20ES1356**	Data Structures Lab	1.7		1.80		2.27				2.27	2.25			2.38	
25	**20CS3352**	Python Programming	3		3.00		2.95				2.95	3			2.95	

S.No	COURSE CODE	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
26	**20SO8355**	Introduction to Linux Operating System		2.3	2.20		2.47	2.2			2.45	2.99	2.43		2.27	
27	**20MC1301**	Environmen Sciences	2.4	2.4					2.4							2.4
28	**20CS3391**	Community Service Project	2.21	2.21	2.19	2.19	2.08	2.08	2.08	2.19	2.06	2.06	2.06	2.19	2.14	2.14
29	**20BS1403**	Formal Languages and Automata Theory	1.82	2.2							2.19	2.08		2.19	2.06	
30	**20CS3401**	Operating Systems	1.93	1.3							1.3	1.3			2.16	
31	**20CS3402**	Advanced Data Structures	2.03	2.45							2.36	2.36		2.36	2.32	2.36
32	**20CS3403**	Design and Analysis of Algorithms	1.72	2							2.19	2.19		2.19		
33	**20ES1402**	Internet of Things	2.55	2.62			2.6							2.38	2.56	2.56
34	**20ES1452**	Internet of Things Lab	2.48	3	2.53		2.65				2.48	2.48				2.7
35	**20CS3451**	Advanced Data Structures through C++ Lab		1.8	2.18		2.74				2.74	2.42				2.8
36	**20CS3452**	Design and Analysis of Algorithms Lab	2.498		2.97		2.99				2.99	2.256			2.99	
37	**20SO8454**	Programming with JAVA		2.3	2.20		2.47	2.2			2.45	2.99	2.43		2.27	
38	**20CS3501**	Software Engineering	1.99	2							2.04	2.03			2.01	
39	**20CS3502**	Database Management Systems	1.95	2.1				2.06			2.06	2.06			2.13	

S.No	COURSE CODE	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
40	**20CS3503**	Computer Networks	1.85	2.5							1.94	1.94			1.35	
41	**20ME2501A**	Design Thinking	2.73			2.73	2.73		2.73	2.73	2.73	2.73	2.74	2.73	2.73	
42	**20CS4501A**	Data Science	1.68					2	1.55		1.91	1.89				1.79
43	**20CS4501D**	Artificial Intelligence	1.86	2				2.01			1.95	1.95		2.01	1.59	
44	**20CS3551**	Database Management Systems Lab	1.93		2.34		2.52				2.52	2.47			2.35	
45	**20CS3552**	Computer Networks Lab	1.98		2.13		2.54				2.54	2.49			2.83	
46	**20SS8551**	Soft Skills								2.21	2.21	2.21		2.21		
47	**20MC1501**	Constitution of India						2.03		2.03	2.03					
48	**20CS3581A**	Summer Internship								2.11	2.15	2.11	1.98		2.18	
49	**20CS3601**	Compiler Design	2.03	2							2.04	2.04			1.97	
50	**20CS3602**	Machine Learning	1.68	1.9				2	1.95		1.9	1.9				2
51	**20CS3603**	MERN Stack Development	1.99		1.73						1.73	1.73			1.73	
52	**20ME2601A**	Value Engineering	2.03	2	2.03			2.03			2.03		2.03			2
53	**20ME2601B**	Human Factors in Engineering	1.97		1.97			2			1.97			1.97	1.97	2
54	**20CS4601A**	Design Patterns	1.98	1.7				2			1.7	1.7			2.4	
55	**20CS4601C**	Block Chain Technology	1.68	2.3							2.28	2.28				1.9
56	**20CS3651**	Compiler Design Lab	1.92		1.94		2.24				2.24	2.37			2.09	
57	**20CS3652**	Machine Learning Lab		2.9	2.97		2.87	2.94			1.96	2.93	1.96			2.9
58	**20CS3653**	MERN Stack Development Lab		1.8			2.88	2			2.88	2.38				3

S.No	COURSE CODE	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
59	**20SA8651**	Mobile App Development		1.6	0.64		1.04	1			1.62	2.2	2.19		1.61	
60	**20MC1602**	Universal Human Values	2.33							2.31	2.33	2.3		2.3	2.28	
61	**20CS4701A**	Deep Learning	1.78	1.9							1.89	1.95		1.89	1.99	
62	**20CS4701B**	Software Testing Methodologies	2.01	2							2.03	2.03				2.2
63	**20CS4701C**	Cloud Computing	1.86	2.1							2.05	2.05				2.2
64	**20CS4702B**	Software Project Management	1.9	1.8	1.77			1.83			1.98			1.95		2.2
65	**20CS4702C**	Cyber Security	2.02					2.02	2.02	2.09	1.86	1.86				2.05
66	**20CS4703C**	User Interface Design	2.1	2.16	2.18		1.98	2.13	2.13		2.23			2.14	2.18	
67	**20EC2701B**	E – WASTE MANAGEMENT	2.01	2				2.01	2.01			2.01		2.01		2
68	**20EE2701A**	Non- Conventional Energy Resources	1.92	2					1.91		2.19	2.19		2.19	2.03	2
69	**20ME2701B**	Management Information Systems	2.04	2.04			2.04			2.04	2.04	2.04	2.04	2.04	2.04	2.04
70	**20CE2702A**	Environmental Management and Audit	2.31	2.3	2.33				2.31						2.33	2.3
71	**20ME2702B**	Robotics	1.97	2.11	1.84		1.88								1.97	1.97
72	**20HS7701C**	Entrepreneurship Management	1.87		1.87			2		1.74	1.87		1.87	1.87		
73	**20SA8755**	Sales Force Technologies		1.93	1.93		1.93	1.93			1.59	1.96	1.25		1.93	

S.No	COURSE CODE	Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
74	**20CS3781B/C**	Industrial/Research Internship								1.99	1.97	2.03	1.99		2.22	
75	**20CS3861**	Project work, seminar internship in industry	1.96	1.99	1.96	1.96	1.95	1.95	1.95	1.96	2.02	2.02	2.02	1.98	1.96	1.96
PO Attainment			**2.10**	**2.10**	**2.14**	**2.38**	**2.36**	**2.02**	**2.18**	**2.13**	**2.21**	**2.28**	**2.08**	**2.22**	**2.22**	**2.24**
Mapped Courses Count			**60**	**48**	**26**	**6**	**26**	**22**	**13**	**11**	**65**	**64**	**14**	**28**	**50**	**28**
Not attained Courses Count			**20**	**10**	**9**	**0**	**4**	**3**	**2**	**1**	**11**	**7**	**2**	**3**	**6**	**3**
PO's			**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**

8.1.2A. Documentary evidences of identification of gaps in PO's/ PSO's attainment

Target for all Program Outcome(PO's/PSO's)-(PVP20 Regulation-20 Admitted Batch) – 1.95					
PO-1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.					
S. No	**Code**	**Course Name**	**PO1-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
1	20BS1303	Discrete Mathematical Structures	1.91	-0.04	Math concepts may not be clearly connected to practical applications.
2	20CS3301	Fundamentals of Digital Logic Design	1.93	-0.02	
3	20BS1403	Formal Languages and Automata Theory	1.82	-0.13	
4	20CS4501A	Data Science	1.68	-0.27	
5	20CS4501D	Artificial Intelligence	1.86	-0.09	
6	20CS3602	Machine Learning	1.68	-0.27	
7	20CS4701A	Deep Learning	1.78	-0.17	
8	20ES1356	Data Structures Lab	1.7	-0.25	Labs may focus on standard programs rather than open-ended, complex problems.
9	20CS3651	Compiler Design Lab	1.92	-0.03	
10	20CS3551	Database Management Systems Lab	1.93	-0.02	
11	20ES1305	Data Structures	1.78	-0.17	Students may focus on syntax or small tasks, lacking exposure to solving integrated engineering problems.
12	20CS3403	Design and Analysis of Algorithms	1.72	-0.23	
13	20CS3401	Operating Systems	1.93	-0.02	Courses may be taught conceptually, but lack practical application scenarios.
14	20CS3503	Computer Networks	1.85	-0.1	
15	20CS4701C	Cloud Computing	1.86	-0.09	

16	20CS4601C	Block Chain Technology	1.68	-0.27	
17	20CS4702B	Software Project Management	1.9	-0.05	
18	20EE2701A	Non- Conventional Energy Resources	1.92	-0.03	
19	20HS7701C	Entrepreneurship Management	1.87	-0.08	
	20MC1201	Life Sciences for Engineers	1.8	-0.15	

PO - 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.

S. No	Code	Course Name	PO2-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20ES1101	Basic Electrical & Electronics Engineering	1.93	-0.02	Students may fail to see how foundational knowledge integrates into advanced computing systems and intelligent solutions.
2	20CS3401	Operating Systems	1.3	-0.65	
3	20CS4601A	Design Patterns	1.7	-0.25	
4	20CS3451	Advanced Data Structures through C++ Lab	1.83	-0.12	Lab work focuses on syntax rather than solving challenging, real-world problems, critical thinking may not develop.
5	20CS3653	MERN Stack Development Lab	1.8	-0.15	Lack of practice in formulating real-world problems
6	20SA8651	Mobile App Development	1.6	-0.34	
7	20CS4702B	Software Project Management	1.8	-0.12	These courses should use realistic client problems or scenarios to apply knowledge to actual use cases.
8	20SA8755	Sales Force Technologies	1.93	-0.02	
9	20CS3602	Machine Learning	1.9	-0.05	Students may struggle to break down a complex system into solvable components
10	20CS4701A	Deep Learning	1.9	-0.06	

PO - 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.					
S. No	**Code**	**Course Name**	**PO3-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
1	20ES1253	Programming for Problem Solving Lab	1.69	-0.26	Limited exposure to real-world problems which require optimized solutions.
2	20ES1356	Data Structures Lab	1.8	-0.15	
3	20CS3603	MERN Stack Development	1.73	-0.22	Limited exposure to real-world constraints.
4	20CS3651	Compiler Design Lab	1.94	-0.01	
5	20SA8651	Mobile App Development	0.64	-1.31	
6	20SA8755	Sales Force Technologies	1.93	-0.02	
7	20CS4702B	Software Project Management	1.77	-0.18	Courses may be taught conceptually, but lack practical application scenarios.
8	20ME2702B	Robotics	1.84	-0.11	
9	20HS7701C	Entrepreneurship Management	1.87	-0.08	
PO 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.					
S. No	**Code**	**Course Name**	**PO4-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
All Courses Attained					
PO 5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.					
S. No	**Code**	**Course Name**	**PO5-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
1	20MC1201	Life Sciences for Engineers	1.9	-0.05	Limited exposure to the modern tools
2	20SA8651	Mobile App Development	1.04	-0.91	

3	20ME2702B	Robotics	1.88	-0.07	
4	20SA8755	Sales Force Technologies	1.93	-0.02	

PO 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.

S. No	Code	Course Name	PO6-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20SA8651	Mobile App Development	1	-0.95	Encourage students to include these technologies in community service project (CSP).
2	20CS4702B	Software Project Management	1.83	-0.12	
3	20SA8755	Sales Force Technologies	1.93	-0.02	

PO 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.

S. No	Code	Course Name	PO7-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20CS4501A	Data Science	1.55	-0.4	Courses may be taught conceptually, but lack practical application scenarios.
2	20EE2701A	Non- Conventional Energy Resources	1.91	-0.04	

PO 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

S. No	Code	Course Name	PO8-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20HS7701C	Entrepreneurship Management	1.74	-0.21	The course may emphasize innovation and profit but underplay ethical issues in entrepreneurship

PO 9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.					
S. No	**Code**	**Course Name**	**PO9-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
1	20CS3602	Machine Learning	1.9	-0.05	Lack of structured team-based projects
2	20CS3603	MERN Stack Development	1.73	-0.22	
3	20SA8651	Mobile App Development	1.62	-0.33	
4	20SA8755	Sales Force Technologies	1.59	-0.36	
5	20CS3401	Operating Systems	1.3	-0.65	Most assignments are individual, offering little or no opportunity to practice team dynamics or division of responsibilities
6	20CS3503	Computer Networks	1.94	-0.01	
7	20CS4501A	Data Science	1.91	-0.04	
8	20CS4601A	Design Patterns	1.7	-0.25	
9	20CS4701A	Deep Learning	1.89	-0.06	
10	20CS4702C	Cyber Security	1.86	-0.09	
11	20HS7701C	Entrepreneurship Management	1.87	-0.08	Lack of group activities offering no opportunity to practice tem work
PO 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.					
S. No	**Code**	**Course Name**	**PO10-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
1	20CS3401	Operating Systems	1.3	-0.65	Evaluations are typically submission-based, without requiring verbal presentations of design or implementation
2	20CS3503	Computer Networks	1.94	-0.01	
3	20CS4501A	Data Science	1.89	-0.06	

4	20CS4601A	Design Patterns	1.7	-0.25	
5	20CS4702C	Cyber Security	1.86	-0.09	
6	20CS3602	Machine Learning	1.9	-0.05	
7	20CS3603	MERN Stack Development	1.73	-0.22	

PO 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.

S. No	Code	Course Name	PO11-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20HS7701C	Entrepreneurship Management	1.87	-0.08	Teams had limited experience in leadership and team-based project management.
2	20SA8755	Sales Force Technologies	1.25	-0.7	

PO 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.

S. No	Code	Course Name	PO12-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20ES1305	Data Structures	1.80	-0.15	Assignments are often instructor-guided, offering little scope for independent research, experimentation, or learning new resources
2	20CS4701A	Deep Learning	1.89	-0.06	
3	20HS7701C	Entrepreneurship Management	1.87	-0.08	

PSO - I: Apply the Knowledge of Computing Skills in building the Software Systems that meet the requirements of Industry and Society.

S. No	Code	Course Name	PSO1-Direct	Gap between the target and achievement	Identified Areas of Weakness
1	20ES1305	Data Structures	1.80	-0.15	Exercises often focus on academic problems instead of real-world or domain-specific use cases from industry or society.
2	20CS3503	Computer Networks	1.35	-0.6	
3	20CS4501D	Artificial Intelligence	1.59	-0.36	

4	20CS3603	MERN Stack Development	1.73	-0.22	Students may build parts of systems but lack experience in full software lifecycle, including deployment, security, and maintenance.
5	20SA8651	Mobile App Development	1.61	-0.34	
6	20SA8755	Sales Force Technologies	1.93	-0.02	
PSO - II : Apply the Knowledge of Data Engineering and Communication Technologies for Developing Applications in the Domain of Smart and Intelligent Computing.					
S. No	**Code**	**Course Name**	**PSO2-Direct**	**Gap between the target and achievement**	**Identified Areas of Weakness**
1	20CS4501A	Data Science	1.79	-0.16	Students may learn concepts in isolation, without developing end-to-end applications.
2	20CS4601C	Block Chain Technology	1.88	-0.07	
3	20MC1201	Life Sciences for Engineers	1.9	-0.05	Limited hands-on experience with real data and tools hinders students' application of data engineering in smart life science solutions.

8.1.2B Plan of action to bridge the gaps /Improvement

<table>
<tr><th colspan="5">PO-1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.</th></tr>
<tr><th>S. No</th><th>Code</th><th>Course Name</th><th>Identified Areas of Weakness</th><th>Plan of Action</th></tr>
<tr><td>1</td><td>20BS1303</td><td>Discrete Mathematical Structures</td><td rowspan="7">Math concepts may not be clearly connected to practical applications.</td><td rowspan="7">Demonstrate how mathematical concepts are applied in areas like Machine Learning, Deep Learning, Artificial Intelligence and Data Science.
Illustrate the application of mathematical concepts in fields such as Machine Learning, Deep Learning, Artificial Intelligence, and Data Science.</td></tr>
<tr><td>2</td><td>20CS3301</td><td>Fundamentals of Digital Logic Design</td></tr>
<tr><td>3</td><td>20BS1403</td><td>Formal Languages and Automata Theory</td></tr>
<tr><td>4</td><td>20CS4501A</td><td>Data Science</td></tr>
<tr><td>5</td><td>20CS4501D</td><td>Artificial Intelligence</td></tr>
<tr><td>6</td><td>20CS3602</td><td>Machine Learning</td></tr>
<tr><td>7</td><td>20CS4701A</td><td>Deep Learning</td></tr>
<tr><td>8</td><td>20ES1356</td><td>Data Structures Lab</td><td rowspan="2">Labs may focus on standard programs rather than open-ended, complex problems.</td><td rowspan="2">Design lab tasks around real-world applications and ask students to propose multiple solutions to a problem and identify the optimized solution.</td></tr>
<tr><td>9</td><td>20CS3651</td><td>Compiler Design Lab</td></tr>
</table>

10	20CS3551	Database Management Systems Lab		• Provide more number of problems with varying solution paths to develop analytical thinking. • Develop lab tasks based on real-world domains such as hospital management, library systems requiring students to create normalized databases and write complex queries.
11	20ES1305	Data Structures	Students may focus on syntax or small tasks, lacking exposure to solving integrated engineering problems.	• Create problems with varying difficulty levels—easy, medium, and complex—that allow students to explore multiple solution approaches and arrive at an optimized, well-justified final solution.
12	20CS3403	Design and Analysis of Algorithms		
13	20CS3401	Operating Systems	Courses may be taught conceptually, but lack practical application scenarios.	Incorporate real-world examples and case studies into lectures to illustrate how theoretical concepts are applied in practice.
14	20CS3503	Computer Networks		
15	20CS4701C	Cloud Computing		
16	20CS4601C	Block Chain Technology		
17	20CS4702B	Software Project Management		
18	20EE2701A	Non- Conventional Energy Resources		
19	20HS7701C	Entrepreneurship Management		
20	20MC1201	Life Sciences for Engineers		

PO - 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.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20ES1101	Basic Electrical & Electronics Engineering	Students may fail to see how foundational knowledge integrates into advanced computing systems and intelligent solutions.	• Introduce short modules or review sessions that recap relevant foundational concepts before starting advanced applications in upper-level courses.
2	20CS3401	Operating Systems		
3	20CS4601A	Design Patterns		
4	20CS3451	Advanced Data Structures through C++ Lab	Lab work focuses on syntax rather than solving challenging, real-world problems, critical thinking may not develop.	• Include selected challenges from platforms like LeetCode, CodeForces, or HackerRank in lab assessments.(suggest for next batches)
5	20CS3653	MERN Stack Development Lab	Lack of practice in formulating real-world problems	• Include problem statements that require students to analyze user needs, define requirements, and propose technical solutions. • Introduce project based learning in Labs.
6	20SA8651	Mobile App Development		
7	20CS4702B	Software Project Management	These courses should use realistic client problems or scenarios to apply knowledge to actual use cases.	• Demonstrate real-time project case studies.
8	20SA8755	Sales Force Technologies		• Students learn to model and automate Customer Relationship Management (CRM) workflows using Sales force such as Laptop rentals, garage management system and supply leftover food etc.
9	20CS3602	Machine Learning	Students may struggle to break down a complex system into solvable components	• Illustrate practical, real-world applications across different domains like health care and Finance and teach students how to approach complex problems by applying ML concepts such as data pre-processing, model training, and evaluation.
10	20CS4701A	Deep Learning		

PO - 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.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20ES1253	Programming for Problem Solving Lab	Limited exposure to real-world problems which require optimized solutions.	• Practice problems with varying difficulty levels—easy, medium, and complex—that allow students to explore multiple solution approaches and arrive at an optimized, well-justified final solution. • Include evaluation parameters based on time complexity, space usage, and code readability in lab assessments. • Organize coding contests with real-world problem statements
2	20ES1356	Data Structures Lab		
3	20CS3651	Compiler Design Lab	Lab exercises are more about applying known methods rather than designing new ones.	• Include viva or written tests where students are required to justify design choices in their grammar, parsing strategy, or code optimization logic.
4	20CS3603	MERN Stack Development	Limited exposure to real-world constraints.	• Require a group project to develop a fully functional MERN application, addressing real-world constraints like cross-browser compatibility and responsive design.
5	20SA8651	Mobile App Development		
6	20SA8755	Sales Force Technologies		
7	20CS4702B	Software Project Management	Courses may be taught conceptually, but lack practical application scenarios.	• Incorporate real-world examples and case studies into lectures to illustrate how theoretical concepts are applied in practice
8	20ME2702B	Robotics		
9	20HS7701C	Entrepreneurship Management		

PO 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.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
All Courses Attained				
PO 5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20MC1201	Life Sciences for Engineers	Courses may be taught conceptually, but lack practical application scenarios.	• Demonstrate usage of biological tools in class room. • Demonstrate the realtime case studies using tools.
2	20ME2702B	Robotics		
3	20SA8651	Mobile App Development	Limited exposure to the modern tools	• Suggest implementing more experiments using Android Tool and Introduce additional tools like **Firebase and** Advanced Recycler view for developing user-friendly applications. • Implement projects using sales force technologies.
4	20SA8755	Sales Force Technologies		
PO 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.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20SA8651	Mobile App Development	Encourage students to include these	• Encourage students to Develop projects related to

2	20CS4702B	Software Project Management	technologies in community service project (CSP).	societal needs. • Incorporate real-world examples and case studies into lectures to illustrate how theoretical concepts are applied in practice.
3	20SA8755	Sales Force Technologies	Limited exposure to real-world constraints.	• Implement projects using sales force technologies.

PO 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.

S. No	Code	Course Name	Identified Areas of Weakness	Plan of Action
1	20CS4501A	Data Science	Courses may be taught conceptually, but lack practical application scenarios.	• Incorporate real-world examples and case studies into lectures to illustrate how theoretical concepts are applied in practice
2	20EE2701A	Non- Conventional Energy Resources		

PO 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

S. No	Code	Course Name	Identified Areas of Weakness	Plan of Action
1	20HS7701C	Entrepreneurship Management	The course may emphasize innovation and profit but underplay ethical issues in entrepreneurship	• Demonstrate the Real-world ethical challenges and resolutions.

PO 9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

S. No	Code	Course Name	Identified Areas of Weakness	Plan of Action
1	20CS3602	Machine Learning	Lack of structured team-based projects	• Introduce **group projects** focused on real-world datasets (e.g., healthcare, finance, and social media).
2	20CS3603	MERN Stack Development		
3	20SA8651	Mobile App Development		

4	20SA8755	Sales Force Technologies		• Conduct mini group labs (e.g., 3-4 students) on experiments like regression, classification, clustering. • Divide students into teams to build full-stack applications (e.g., e-commerce, task manager). • Assign projects to build cross-platform apps • Form teams to develop Salesforce-based CRM solutions.
5	20CS3503	Computer Networks	Most assignments are individual, offering little or no opportunity to practice team activities	• CN-Introduce team-based case studies to be simulated using tools.
6	20CS3401	Operating Systems	Most assignments are individual, offering little or no opportunity to practice team activities	• Introduce team-based activities on various concepts of the course.
7	20CS4501A	Data Science		
8	20CS4601A	Design Patterns		
9	20CS4701A	Deep Learning		
10	20CS4702C	Cyber Security		
11	20HS7701C	Entrepreneurship Management		

PO 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.

S. No	Code	Course Name	Identified Areas of Weakness	Plan of Action
1	20CS3401	Operating Systems	Evaluations are typically submission-based, without requiring verbal presentations of design or implementation	• Introduce oral presentations on **various topics of the course.**
2	20CS3503	Computer Networks		
3	20CS4501A	Data Science		
4	20CS4601A	Design Patterns		
5	20CS4702C	Cyber Security		

6	20CS3602	Machine Learning		
7	20CS3603	MERN Stack Development		
PO 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.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20HS7701C	Entrepreneurship Management	Teams had limited experience in leadership and team-based project management.	• Introduce **team-based activities on various concepts of the course.** • Assign teams to design and implement a CRM system using Salesforce tools.
2	20SA8755	Sales Force Technologies		
PO 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.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20ES1305	Data Structures	Assignments are often instructor-guided, offering little scope for independent research, experimentation, or learning new resources	• Include problems which are open-ended and requires algorithm comparison task • Give students open-ended tasks as Assignments
2	20CS4701A	Deep Learning		
3	20HS7701C	Entrepreneurship Management		
PSO - I: Apply the Knowledge of Computing Skills in building the Software Systems that meet the requirements of Industry and Society.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20ES1305	Data Structures	Exercises often focus on academic problems instead of real-world or domain-specific use cases from industry or society.	• Encourage practical thinking and optimization skills.
2	20CS3603	MERN Stack Development		
3	20SA8651	Mobile App Development		

4	20SA8755	Sales Force Technologies		
5	20CS3503	Computer Networks	Students may build parts of systems but lack experience in full software lifecycle, including deployment, security, and maintenance.	• Enhance ability to translate academic knowledge to industry-relevant skills.
6	20CS4501D	Artificial Intelligence		
PSO - II : Apply the Knowledge of Data Engineering and Communication Technologies for Developing Applications in the Domain of Smart and Intelligent Computing.				
S. No	**Code**	**Course Name**	**Identified Areas of Weakness**	**Plan of Action**
1	20CS4501A	Data Science	Students may learn concepts in isolation, without developing end-to-end applications.	• Enable full-cycle understanding of workflow.
2	20CS4601C	Block Chain Technology		
3	20MC1201	Life Sciences for Engineers	Limited hands-on experience with real data and tools hinders students' application of data engineering in smart life science solutions.	• Integrate project-based learning with real-world datasets and tools to develop intelligent applications in life sciences.

8.1.2C Implementation

PVP20-Admitted Batch			
S. No	**Code**	**Course Name**	**Implementation**
1	20ES1253	Programming for Problem Solving Lab	• Incorporate open-ended challenges, coding contests, and selected problems from platforms like CodeChef, LeetCode and CodeForces, with assessments based on time complexity, space usage, and code readability to foster practical thinking and optimization skills.
2	20ES1305	Data Structures	
3	20ES1356	Data Structures Lab	
4	20CS3451	Advanced Data Structures through C++ Lab	
5	20CS3403	Design and Analysis of Algorithms	
6	20CS3602	Machine Learning	• Integrate mathematical and machine learning concepts with real-world applications from domains like healthcare and finance through case studies, group projects (ML). • Encourage students to solve open-ended problems, participate in team-based activities, and deliver presentations to develop industry-relevant skills and practical problem-solving abilities.
7	20CS3652	Machine Learning Lab	
8	20CS4501D	Artificial Intelligence	
9	20CS4701A	Deep Learning	
10	20CS4501A	Data Science	
11	20CS4601A	Design Patterns	
12	20BS1303	Discrete Mathematical Structures.	• Include the application of mathematical concepts.
13	20CS3301	Fundamentals of Digital Logic	
14	20BS1403	Formal Languages and Automata Theory	
15	20CS3401	Operating Systems	• Incorporated real-world examples and case studies into lectures to illustrate how

16	20CS3651	Compiler Design Lab	theoretical concepts are applied in practice.
17	20CS3503	Computer Networks	
18		Computer Networks Lab	
19	20CS4701C	Cloud Computing	• Incorporated real-world examples and case studies into lectures to illustrate how theoretical concepts are applied in practice.
20	20CS4601C	Block Chain Technology	
21	20CS4702C	Cyber Security	
22	20CS4702B	Software Project Management	
23	20MC1201	Life Sciences for Engineers	• Integrate real-world examples and case studies into lectures to showcase how theoretical concepts are applied in practical scenarios.
24	20EE2701A	Non- Conventional Energy Resources	
25	20HS7701C	Entrepreneurship Management	
26	20ME2702B	Robotics	
27	20CS3653	MERN Stack Development Lab	• Introduced project based learning
28	20SA8651	Mobile App Development	
29	20SA8755	Sales Force Technologies	