

**PO / PSO Attainment Direct of IARE - UG20 (2021Batch) courses**[illegible]

15	C115	ACSC05	Programming for Problem Solving using C Laboratory	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30		2.30	2.30	2.30	2.30
16	C201	ACSC07	Computer Organization and Architecture	1.90	1.70	2.20	1.90						1.90		1.90	1.90		2.00
17	C202	ACSC08	Data Structures	2.60	2.60	2.60	2.50	2.60					2.70		2.60	2.60	2.60	2.70
18	C203	ACSC12	Operating Systems	0.90	0.90	0.90	0.80	0.40					0.90		0.90	0.90	0.90	0.80
19	C204	ACDC01	Principles of Data Science	1.10	1.00	1.00	1.10	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.10	1.20
20	C205	AITC02	Programming with Objects	2.40	2.50	2.90	2.40	2.40					2.60		2.40	2.50		2.60
21	C206	ACSC09	ExEEd - Prototype / Design Building	3.00	3.00	3.00	3.00	3.00				3.00	3.00		3.00	3.00	3.00	3.00
22	C207	ACSC10	Data Structures Laboratory	2.30	2.30	2.30	2.30	2.30	2.30		2.30	2.30	2.30		2.30	2.30	2.30	2.30
23	C208	ACDC02	Data Science Laboratory	3.00	3.00	3.00		3.00										3.00
24	C209	AITC03	Programming with Objects Laboratory	3.00		3.00		3.00					3.00		3.00		3.00	3.00
25	C210	ACDC03	Data Management and Representation	2.20	2.30	2.30	2.30	2.30					2.30		2.30	2.20	2.30	2.30
26	C211	AITC05	Database Management Systems	1.90	1.90	1.90	1.70	1.70					1.90		1.70	1.80	2.00	
27	C212	ACSC13	Design and Analysis of Algorithms	2.30	2.80	2.80	1.10	1.10					2.20		2.20	2.20	2.20	2.10
28	C213	AITC09	Web Application Development	2.20	1.20	2.20	2.30	2.10							2.90			1.20
29	C214	AHSC13	Business Economics and Financial Analysis	2.80	2.80						2.80	2.80		2.80				
30	C215	ACSC14	Experiential Engineering Education (ExEEd) - Fabrication / Model Development	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
31	C216	AITC07	Database Management Systems Laboratory		3.00	3.00		3.00					3.00		3.00		3.00	
32	C217	AITC10	Web Application Development Laboratory	3.00	3.00	3.00		3.00					3.00		3.00	3.00	3.00	3.00
33	C218	ACSC16	Linux Programming Laboratory	3.00	3.00	3.00										3.00	3.00	
34	C301	AITC04	Theory of Computation	2.20	2.00	2.30	2.30						2.20		2.20		1.60	2.40
35	C302	AITC06	Computer Networks	2.80	2.80	2.80	2.80						2.80		2.80	2.80	2.80	2.80

36	C303	ACDC04	Software Engineering	2.60	2.60	2.70	2.60	2.60	2.60		2.70	2.60	2.60	2.70	2.60	2.60	2.60	2.60
37	C304	ACDC05	Data Wrangling with Python	1.10	1.30	1.10	1.10	1.30					1.40			1.10	1.70	1.10
38	C305	ACDC08	Image Processing and Analysis	2.30	2.20	2.50	2.40	2.30							2.00	2.50		
39	C306	ACSC20	ExEEd - Project Based Learning	3.00	3.00	3.00	3.00	3.00	3.00			3.00	3.00		3.00	3.00	3.00	3.00
40	C307	ACSC21	Object Oriented Software Design Laboratory		3.00	3.00	3.00	3.00							3.00		3.00	3.00
41	C308	ACDC09	Data Wrangling and Visualization Laboratory	3.00	3.00	3.00		3.00					3.00			3.00	3.00	3.00
42	C309	ACSC40	Compiler Design	2.80	2.80	2.80		2.80					2.80		2.80		2.80	2.80
43	C310	ACAC13	Natural Language Processing	1.20	0.70	0.40	1.20	0.80					0.40			1.20	0.80	
44	C311	ACAC03	Foundations of Machine Learning	2.40	2.40	2.30	2.50	2.30							2.30	2.30		2.30
45	C312	ACIC10	Principals of IoT	2.30	2.30	2.30	2.20									2.40		
46	C313	AHSC15	Soft Skills and Interpersonal Communication								1.20	1.20	1.20					
47	C314	ACSC27	Experiential Engineering Education (ExEEd) Research Based Learning	3.00			3.00						3.00					
48	C315	ACAC04	Foundations of Machine Learning Laboratory	3.00	3.00	3.00	3.00	3.00		3.00	3.00				3.00	3.00		3.00
49	C316	ACAC15	Natural Language Processing Laboratory	3.00		3.00		3.00										3.00
50	C401	ACSC31	Big Data and Analytics	2.80	2.80	2.80		2.80					2.80		2.80	2.80	2.80	2.80
51	C402	ACDC24	Mathematical Logic in Artificial Intelligence	2.80	2.80	2.80	2.80	2.80	2.80						2.80	2.80	2.80	2.80
52	C403	ACDC12	Human Computer Interaction (UI & UX)	2.20	1.10	1.10		1.10					0.90			1.10	1.00	1.10
53	C404	ACDC13	Data Mining	2.80	2.80	2.80	2.80	2.80					2.80		2.80	2.80	2.80	2.80
54	C405	AECC40	Embedded Systems	2.60	2.70	2.70		2.60					2.70			2.80		
55	C406	ACSC34	Big Data and Analytics Laboratory	3.00	3.00	3.00		3.00					3.00		3.00	3.00	3.00	3.00

56	C407	ACDC25	Artificial Intelligence Laboratory	3.00	3.00	3.00		3.00								3.00	3.00	
57	C408	ACDC17	Project Work (Phase – I)	3.00	3.00	3.00	3.00	3.00	3.00		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
58	C409	ACDC18	Information Retrieval Systems	1.40	1.30	1.40							1.40			1.20	1.50	
59	C410	ACDC21	Computer Vision	1.20	1.20	1.20	1.20	1.20							1.20	1.20	1.20	
60	C411	ACEC31	Disaster Management	1.70					1.70	1.70		1.70						
61	C412	ACDC23	Project Work (phase – II) / Full Semester Internship	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Attainment Value				2.5	2.4	2.5	2.4	2.4	2.6	2.6	2.7	2.6	2.4	2.6	2.5	2.4	2.4	2.5

PO/PSO Attainment Indirect:

Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Student exit surveys(b)	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.7	2.6	2.6
Alumni Survey (c)	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.6
Employer surveys(d)	2.5	2.4	2.3	2.5	2.5	2.3	2.5	2.5	2.3	2.5	2.4	2.3	2.5	2.4	2.3
Indirect Attainment	2.4	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.6	2.5	2.5

PO/PSO Attainment

PO/PSO Overall Attainment																
Regulation		R20														
Branch		Computer Science and Engineering (Data Science)														
Batch		2021-2025														
S.No	Assessment Components (Direct + Indirect)	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Direct Assessment (CIA + SEE + Course End Survey) (a)	2.5	2.4	2.5	2.4	2.4	2.6	2.6	2.7	2.6	2.4	2.6	2.5	2.4	2.4	2.5
2	Program Exit Survey (b)	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.7	2.6	2.6
3	Alumni Survey (c)	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.6
4	Employer Survey (d)	2.5	2.4	2.3	2.5	2.5	2.3	2.5	2.5	2.3	2.5	2.4	2.3	2.5	2.4	2.3
Final attainment = $a*0.8 + b*0.1 + c*0.05 + d*0.05$		2.5	2.4	2.5	2.4	2.4	2.5	2.6	2.6	2.5	2.4	2.6	2.5	2.5	2.4	2.5

PO/PSO Attainment Level:(From Uploaded Document)

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Indirect Attainment	2.4	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.6	2.5	2.5
Direct Attainment	2.5	2.4	2.5	2.4	2.4	2.6	2.6	2.7	2.6	2.4	2.6	2.5	2.4	2.4	2.5

POs Attainment Levels and Actions for Improvement

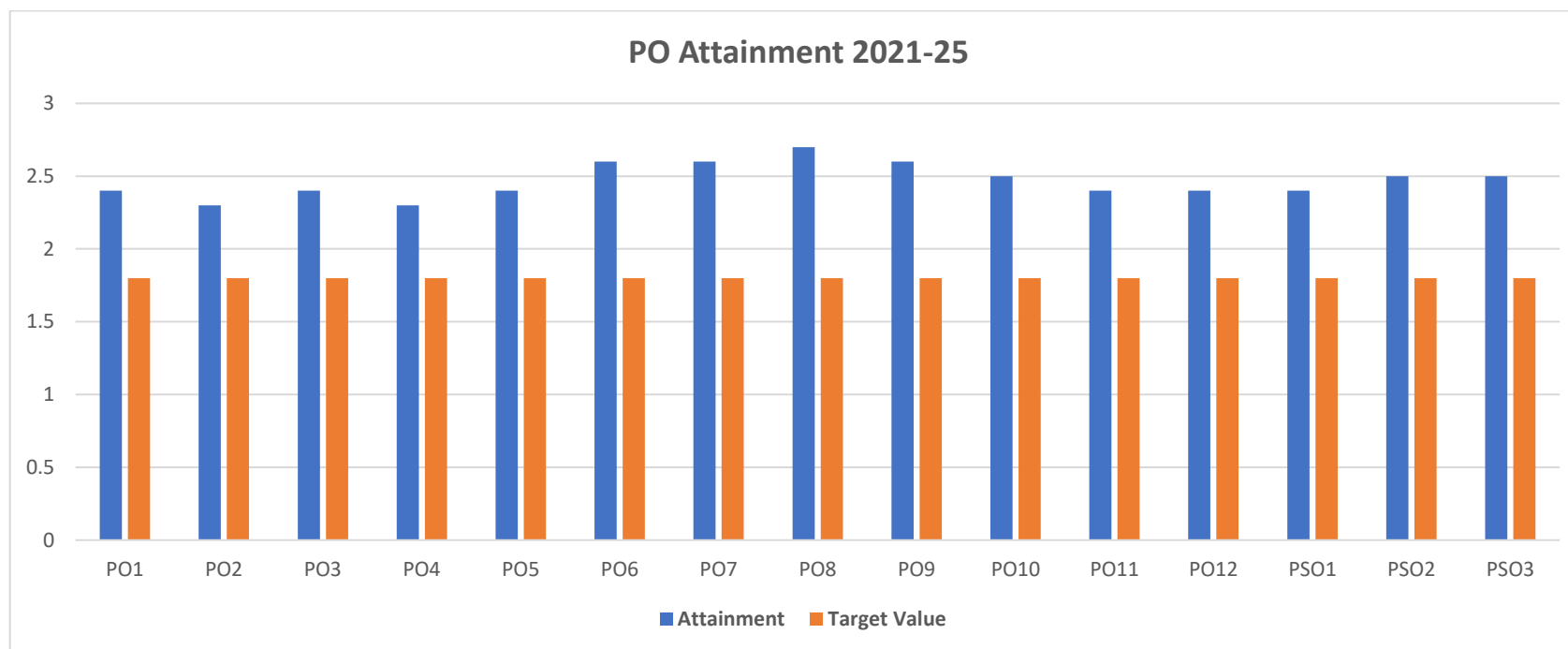
POs	Target Level	Attainment Level	Observation
PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO1	1.8	2.5	PO1 is attained, indicating students effectively apply mathematics, science, and engineering fundamentals to solve complex engineering problems.
Action1: Continue emphasizing real-world problem-solving in lectures and labs. Action2: Introduce mini-projects and case studies to strengthen application of engineering knowledge. Action3: Conduct periodic quizzes and assignments to assess and reinforce understanding. Action4: Provide mentorship and guided learning sessions for students needing additional support.			
PO2: 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.			
PO2	1.8	2.4	PO2 is attained, indicating that students are able to identify, formulate, review literature, and analyze complex engineering problems using first principles of mathematics, natural sciences, and engineering sciences.
Action 1: Include problem-based learning sessions with real-world case studies. Action 2: Assign literature review and research tasks to develop analytical skills. Action 3: Conduct workshops on modeling, simulation, and solution analysis for complex problems			
PO3: 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.			
PO3	1.8	2.5	PO3 is attained, indicating that students are able to design solutions for complex engineering problems, including system components or processes, while considering public health, safety, and societal, cultural, and environmental aspects.
Action1: Conduct design-oriented projects and case studies integrating real-world constraints. Action2: Organize workshops on sustainable and socially responsible engineering design. Action3: Encourage team-based assignments to develop practical solution design and decision-making skills.			
PO4: 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.			
PO4	1.8	2.4	PO4 is attained, indicating that students are able to use research-based knowledge and methods, including experimental design, data analysis, and synthesis, to draw valid conclusions for complex problems.
Action1: Include laboratory experiments and research projects to enhance investigative skills. Action2: Conduct data analysis workshops using statistical and computational tools. Action3: Encourage critical evaluation of research literature and interpretation of results.			
PO5: 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.			
PO5	1.8	2.4	PO5 is attained, indicating that students are able to select and apply appropriate modern engineering and IT tools, including prediction and modeling techniques, while understanding their limitations in complex engineering activities.

Action1: Conduct hands-on sessions using industry-standard software and simulation tools. Action2: Assign projects requiring application of modern tools for problem-solving and modeling. Action3: Organize workshops and tutorials on emerging engineering and IT tools.			
PO6: 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.			
PO6	1.8	2.5	PO6 is attained, indicating that students are able to apply reasoning and contextual knowledge to assess societal, health, safety, legal, and cultural issues, along with the associated professional responsibilities.
Action1: Include case studies highlighting societal and ethical impacts of engineering solutions. Action2: Organize seminars on legal, health, and safety standards in engineering practice. Action3: Encourage community engagement and socially relevant projects. Action4: Conduct workshops on professional ethics and responsibility in engineering.			
PO7: 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.			
PO7	1.8	2.6	PO7 is attained, indicating that students understand the impact of professional engineering solutions on society and the environment and demonstrate awareness of the need for sustainable development.
Action1: Integrate sustainability concepts into project-based learning and assignments. Action2: Conduct workshops on environmental impact assessment and green technologies. Action3: Encourage participation in eco-friendly and socially responsible engineering initiatives.			
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
PO8	1.8	2.6	PO8 is attained, indicating that students are able to apply ethical principles and adhere to professional ethics, responsibilities, and norms in engineering practice.
Action1: Conduct sessions on engineering ethics and case studies of ethical dilemmas. Action2: Include discussions on professional responsibilities and code of conduct in coursework. Action3: Encourage participation in seminars and workshops focused on ethical decision-making in engineering.			
PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings			
PO9	1.8	2.5	PO9 is attained, indicating that students can function effectively as individuals and as members or leaders in diverse, multidisciplinary teams.
Action1: Assign group projects and collaborative tasks to strengthen teamwork skills. Action2: Conduct team-based workshops and competitions to develop leadership and coordination. Action3: Encourage peer assessments and reflective practices to enhance team performance.			
PO10: 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.			
PO10	1.8	2.4	PO10 is attained, indicating that students are able to communicate effectively on complex engineering activities through reports, presentations, and clear instructions within the engineering community and society.
Action1: Conduct workshops on technical writing and report preparation. Action2: Organize presentation and communication skill sessions.			

Action3: Encourage peer reviews and feedback to improve clarity and effectiveness in communication.			
PO11: 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.			
PO11	1.8	2.6	PO11 is attained, indicating that students are able to apply engineering and management principles to manage projects effectively as team members or leaders in multidisciplinary environments.
Action1: Include project-based learning with defined management roles for students.			
Action2: Conduct workshops on project planning, scheduling, and resource management.			
Action3: Encourage use of project management tools and software for real-time tracking and reporting.			
PO12: 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.			
PO12	1.8	2.5	PO12 is attained, indicating that students recognize the need for and demonstrate the ability to engage in independent and life-long learning in the context of ongoing technological change.
Action1: Encourage self-directed learning through online courses and certifications.			
Action2: Promote participation in workshops, seminars, and webinars on emerging technologies.			
Action3: Assign research-based projects to develop continuous learning and problem-solving skills.			

PSOs Attainment Levels and Actions for Improvement

PSOs	Target Level	Attainment Level	Observation
PSO1: Build suitable statistical models, tools and techniques to analyse large data sets for visualization and interpretation.			
PSO1	1.8	2.5	Target Achieved
Action 1: Target will be retained and will be observed for next academic year.			
Action2: To strengthen the domain knowledge and make them job ready graduates, department is planning to introduce more number of professional elective courses.			
PSO2: Focus on improving software reliability, network security or information retrieval systems.			
PSO2	1.8	2.4	Target Achieved
Action 1: To strengthen the software reliability, network security and emerging technologies innovative techniques are using by Hackathon programs.			
PSO3: Make use of computing theory, mathematics, statistical methods and the principles of optimization techniques in data analytics for providing solutions.			
PSO3	1.8	2.5	Target achieved. All the events conducted by the department has helped the students to work as an industrial, work in a team, communicate effectively with both internal and external stakeholders there by becoming good computer professionals.
Action 1: Department will be encouraging the students to participate in intra college/inter college/state level/national level/International level activities and events.			
Action 2: Department focusing on mathematics, statistical methods and the principles of optimization techniques in data analytics for providing solutions for real time examples.			




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