INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

Department of CSE (Data Science)

PO / PSO Attainment Direct of IARE - UG20 (2020 Batch) courses

S No	Course No	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	C101	AHSC02	Linear Algebra and Calculus	2.20	1.70													
2	C102	AHSC06	Chemistry	2.50	2.80					2.80								
3	C103	AEEC01	Basic Electrical Engineering	2.30	2.90											2.90		
4	C104	ACSC01	Python Programming	2.10	1.90	2.00		2.10					1.70		1.70	2.10		2.20
5	C105	ACSC06	Experiential Engineering Education (Ex-EEd)- Academic Success	3.00		3.00	3.00		3.00	3.00	3.00	3.00	3.00	3.00		3.00	3.00	
6	C106	AEEC04	Basic Electrical Engineering Laboratory	3.00							3.00	3.00	3.00		3.00	3.00		
7	C107	ACSC02	Python Programming Laboratory	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
8	C108	AMEC04	Engineering Workshop Practice	3.00		3.00			3.00	3.00		3.00						
9	C109	AHSC01	English										2.90					
10	C110	AHSC08	Probability and Statistics	1.90	2.00		1.90	2.30										
11	C111	AHSC09	Applied Physics	2.00	2.00		2.90											
12	C112	ACSC04	Programming for Problem Solving using C	2.00	2.00	2.00		2.00					1.90		2.00	2.10		2.00
13	C113	AHSC04	English Language and Communication Skills Laboratory									3.00	3.00					
14	C114	AHSC05	Physics Laboratory	3.00	3.00		3.00											

15	C115	ACSC05	Programming for Problem Solving using C Laboratory	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
16	C201	ACSC07	Computer Organization and Architecture	1.30	1.20	1.50	1.20						1.20		1.20	1.10		1.90
17	C202	ACSC08	Data Structures	1.80	1.90	1.90	1.70	1.90					2.00		1.90	1.90	2.00	2.00
18	C203	ACSC12	Operating Systems	1.20	1.10	1.10	1.10	0.60					1.10		1.10	1.10	0.90	1.10
19	C204	ACDC01	Principles of Data Science	1.30	1.00	1.00	1.30	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.40	1.30
20	C205	AITC02	Programming with Objects	2.30	2.50	2.40		2.30					2.30		2.80	2.30		2.40
21	C206	ACSC09	Ex-EEd - 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	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
23	C208	ACDC02	Data Science Laboratory	2.10	2.10	2.10		2.10										2.10
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	2.60	2.60	2.60	2.60	2.60					2.60		2.60	2.60	2.40	2.40
26	C211	AITC05	Database Management Systems	2.10	2.00	1.50	1.40									1.70		
27	C212	ACSC13	Design and Analysis of Algorithms	1.80	1.50	0.80	1.70									1.80		
28	C213	AITC09	Web Application Development	2.60	2.80	2.70	2.80	2.50							2.80			2.80
29	C214	AHSC13	Business Economics and Financial Analysis	1.40	1.30						1.30	1.30		1.40				
30	C215	ACSC14	Experiential Engineering Education (Ex-EEd) - 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	2.30	2.20	2.40	2.30						2.30		2.30		1.90	2.40
35	C302	AITC06	Computer Networks	2.50	2.70	2.50	2.20						2.60		2.50	2.20	2.50	2.60

36	C303	ACDC04	Software Engineering	2.60	2.40	2.50	2.80	2.40	2.80		2.40	2.40	2.40	2.50	2.70	2.40	2.50	2.50
37	C304	ACDC05	Data Wrangling with Python	2.70	2.80	2.20	2.70	2.60					2.50			2.80	2.80	2.20
38	C305	ACDC08	Image Processing and Analysis	1.30	1.40	1.40	1.30	1.30							1.10	1.40		
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	2.60	2.50	2.70		2.50					2.60		2.60		2.80	2.40
43	C310	ACAC13	Natural Language Processing	1.10	1.10	1.10	1.10	1.10					1.10			1.10	1.10	
44	C311	ACAC03	Foundations of Machine Learning	0.70	0.70	0.70	0.70	0.70							0.70	0.70		0.70
45	C312	ACDC10	Information Security	2.50	2.50	2.50	2.60						2.50		2.50		2.80	2.40
46	C313	AHSC15	Soft Skills and Interpersonal Communication								2.60	2.90	2.70					
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	2.10	1.90	2.00	2.00	2.10	1.60						2.30	2.00	1.80	2.10
52	C403	ACDC12	Human Computer Interaction (UI & UX)	2.80	2.80	2.80		2.80					2.80			2.80	2.80	2.80
53	C404	ACDC13	Data Mining	0.80	0.80	0.80	0.70	0.70					0.80		0.80	0.80	0.70	0.90
54	C405	AECC40	Embedded Systems	2.80	2.30	2.50		2.80					2.70			2.30		
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 – 1)	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	ACDC20	Cloud Computing Tools and Techniques	2.70	2.40	2.80		2.80							2.80	2.40	2.80	2.60
59	C410	ACDC21	Computer Vision	2.10	2.00	2.00	2.00	2.00							2.10	2.00	2.00	
60	C411	ACEC31	Disaster Management	2.30					2.50	2.40		2.20						
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				**2.4**	**2.3**	**2.4**	**2.3**	**2.4**	**2.7**	**2.7**	**2.8**	**2.7**	**2.5**	**2.4**	**2.4**	**2.4**	**2.6**	**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)	2.0	2.0	2.0	2.0	2.0	1.9	2.2	2.1	2.1	2.1	2.1	2.0	2.2	2.2	2.2
Alumni Survey(c)	2.7	2.6	2.6	2.6	2.6	2.7	2.6	2.7	2.6	2.6	2.6	2.6	2.5	2.4	2.5
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**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**	**2.4**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**	**2.4**	**2.3**	**2.3**

PO/PSO Attainment:

The Table is taken from ESLO tool for the evidence of PO/PSO Attainment.

PO/PSO Attainment

PO/PSO Overall Attainment															
Regulation:		R20													
Branch		Computer Science and Engineering (Data Science)													
Batch		2020-2024													
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)	2.4	2.3	2.4	2.3	2.4	2.7	2.7	2.8	2.7	2.5	2.4	2.4	2.4	2.6	2.5
2	Program Exit Survey (b)	2.0	2.0	2.0	2.0	2.0	1.9	2.2	2.1	2.1	2.1	2.1	2.0	2.2	2.2	2.2
3	Alumni Survey (c)	2.7	2.6	2.6	2.6	2.6	2.7	2.6	2.7	2.6	2.6	2.6	2.6	2.5	2.4	2.5
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		**2.4**	**2.3**	**2.4**	**2.3**	**2.4**	**2.6**	**2.6**	**2.7**	**2.6**	**2.5**	**2.4**	**2.4**	**2.4**	**2.5**	**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	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3
Direct Attainment	2.4	2.3	2.4	2.3	2.4	2.7	2.7	2.8	2.7	2.5	2.4	2.4	2.4	2.6	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	2.4	Target achieved. Hence the same practice will be continued for the next year. Practical approach of teaching programming was adopted to help students to understand the basics of programming.
Action1: The target will be retained. Video lectures will be used to explain the concepts for better understanding. **Action2:** Students will be asked viva questions relating to the basic concepts to refresh their fundamentals in laboratory sessions. **Action3:** Additional classes will be conducted beyond the regular classes for the courses which has less attainment. **Action4:** Co-curricular activities are scheduled in the area of information security, Cyber security, AGILE and AI&ML.			
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	2.3	Target achieved. Hence the same practice will be continued for the next year. Additional classes conducted for numerical courses beyond the regular planned classes has helped the students to perform better.
Action 1: Target will be retained and will be observed for next academic year. **Action2:** Additional classes will be conducted beyond the regular classes for the courses which has less attainment. **Action3**: Conduct Expert lectures, Seminars and Guest lecture to help students in identifying & analysing the real time 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	2.4	Target achieved. Hence the same practice will be continued for the next year. Performance of the students in design related subjects, target and activities like guest lectures, hands-on training Helped to achieve the target.
Action1: Target will be retained and will be observed for next academic year. **Action2:** To conduct Expert lectures, workshop and hands on training session to understand process of designing and analysing real life software problems. **Action3:** Students were encouraged to participate in external inter college technical competitions, coding contests and hackathons.			
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	2.3	Target achieved. Hence the same practice will be continued for the next year. Students were informed to refer IEEE, Elsevier journal papers/ scopus to enhance their research knowledge, analysis and interpretation of data.
Action1: Target will be retained and will be observed for next academic year. **Action2:** National/international conferences are scheduled to promote research culture among students.			
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	Target achieved. Hence the same practice will be continued for the next year. Students were exposed to various modern tools like android kits, Jupyter, Eclipse,

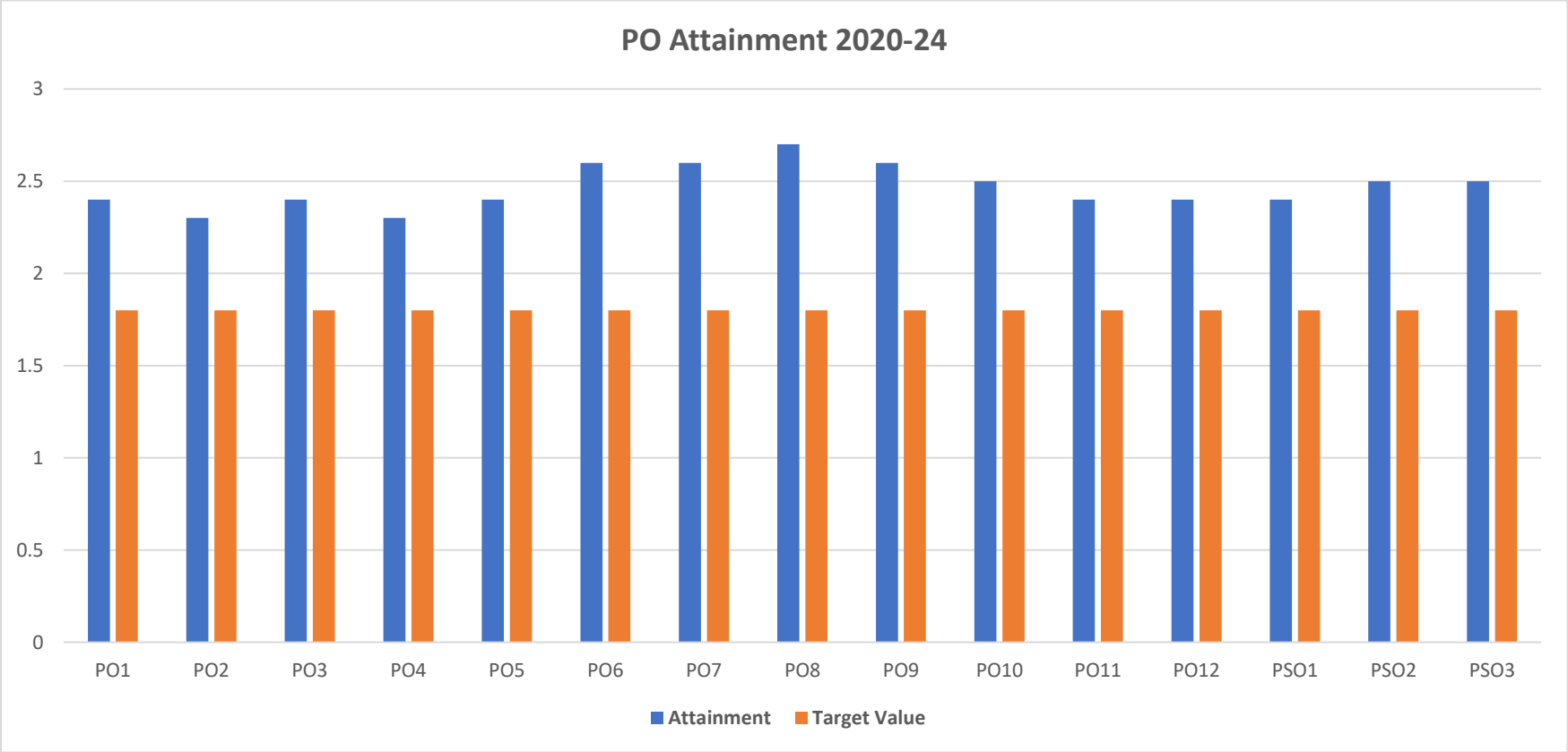
			Pycharm, which helped to attain the target.
Action 1: Target will be retained and will be observed for next academic year. **Action2:** Students are motivated to register for webinars/seminars conducted by third party agencies regarding modern tool usage.			
PO6: The engineer and society: Apply reasoning 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	2.6	Target achieved. Hence the same Practice will be continued for the next year.
Action1: Target will be retained and will be observed for next academic year. **Action 2**: Students have to be exposed to various professional engineering practices followed in the industries through industrial visits. **Action 3**: Continue association with professional bodies like CSI, IEEE Student chapters and CSI, IEEE Students chapters will arrange expert talks to create more awareness among the students about professional engineering practice. **Action 4**: To understand the safety concerns and social aspects, students shall visit industry to expand their practical knowledge with the effect of improved practices in engineering. **Action5**: Students are encouraged to carry out inter domain projects so that they would Realize the importance of a project involving society, safety, health, and the legalities			
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	Target achieved. Hence the same practice will be continued for the next year. Best practices like Telegram is used for intra department communication to eliminate the need of papers.
Action1: Students are encouraged to indulge in mini projects/projects where societal and environmental issues can be addressed. **Action2**: Students are strictly instructed to switch off all electrical Equipment /Resources when not in use for all the laboratories. **Action3**: Best Practices like Rain water harvesting, Sewage treatment plants, proper waste management procedure are employed at our college.			
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
PO8	1.8	2.7	Target achieved. Hence the same practice will be continued for the next year. It is mandatory that students should submit plagiarism certificate for mini projects/project work.
Action 1: Projects/ mini projects will be scrutinized, code reviews will be conducted, plagiarism check will be done to determine the originality of the project to ensure professional ethics.			
PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
PO9	1.9	2.6	Target achieved. Individual work was observed during lab sessions/mini projects/project work. There was an excellent team work observed during peer review presentation/seminars. Students were encouraged to work as a team in all co-curricular and extracurricular activities.
Action 1: Target will be retained and will be observed for next academic year. **Action2**: Students will be encouraged to participate in various co-curricular and extra-curricular activities in other colleges/sports activities/cultural activities. **Action3**: Students are encouraged to participate in Inter College Cultural Events **Action4:** Students were encouraged to participate in external inter college technical competitions, coding contests and hackathons.			

Action5: Department encourages formation of student clubs, participation in technical events/Business ideas/app development.			
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	2.5	Target achieved. Soft skills training was imparted to the students to enhance communication through group discussions and presentations. Project and seminar presentations assisted the students to communicate effectively and efficiently.
Action 1: Target will be retained and will be observed for next academic year. **Action 2:** To enhance the employability skills of the students, training programmes will be conducted on the topics: how to face the interview, career development, higher studies, entrepreneurship development.			
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	2.4	Target achieved.
Action1: Target will be retained and will be observed for next academic year. **Action 2:** Students are encouraged to prepare project proposals with the guidance of faculty for government funding agencies.			
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	2.4	Target achieved. Mini projects/projects which is part of the curriculum has helped the students to Perform better in placement interviews and higher studies.
Action1: Target will be retained and will be observed for next academic year. **Action2:** Students will be motivated to register for GRE/TOEFL/GATE and other competitive examinations.			

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	2.4	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	2.5	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 indusial, work in a team, communicate effectively with both internal and

			external stack holders there by becoming good computer professionals.
Action 1: Department will be encouraging the students to participate in intra collage/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.			



HOD-CSE (DS)

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