



**INSTITUTE OF AERONAUTICAL ENGINEERING**  
(Autonomous)  
Dundigal, Hyderabad - 500 043  
**Department of Electronics and Communication Engineering**

**Attainment of Program Outcomes (POs) and Program Specific Outcomes (PSOs) of 2020 - 2024 batch (IARE - UG20)**

Subject Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
AHSC01	English										2.80					
AHSC02	Linear Algebra and Calculus	2.20	1.70													
AHSC03	Engineering Physics	1.50	1.50		1.40									1.20		
ACSC01	Python Programming	2.50	2.30	2.40		2.50					2.30		2.30	2.50		2.60
AHSC04	English Language and Communication Skills Laboratory									3.00	3.00					
AHSC05	Physics Laboratory	3.00	3.00		3.00									3.00		
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
AHSC06	Chemistry	2.20	2.30					2.80								
AHSC07	Mathematical Transform Techniques	1.70	2.00		2.30									2.00		
AEEC02	Electrical Circuits	1.90	1.90		1.70											
ACSC04	Programming for Problem Solving using C	1.70	1.60	1.70		1.90							1.20	1.20		1.20
ACSC06	Experiential Engineering Education (ExEEd)- Academic Success	3.00		3.00	3.00		3.00	3.00	3.00	3.00	3.00	3.00		3.00	3.00	
AEEC03	Electrical Circuits Laboratory	2.30	2.30		2.30	2.30			2.30	2.30	2.30					
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

AMEC04	Engineering Workshop Practice	3.00		3.00			3.00	3.00		3.00						3.00
AECC01	Electronic Devices and Circuits	1.00	1.00	1.10							1.00			1.20		
AECC02	Signals and Systems	1.40	1.30	1.20		1.10					1.20			0.90		
AECC03	Digital System Design	1.50	1.50	1.40	1.40						1.50				1.70	
AECC04	Probability Theory and Stochastic Processes	1.10	1.10	1.10							1.10					1.10
ACSC08	Data Structures	2.10	2.00	2.00	2.10	1.90	2.30				2.00		2.00	2.00	1.90	2.00
ACSC09	Experiential Engineering Education (ExEEed) - 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
AECC05	Electronic Devices and Circuits Laboratory	2.30	2.30			2.30					2.30				2.30	
AECC06	Digital System Design Laboratory	0.90	0.90	0.90		0.90				0.90	0.90				0.90	
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
AHSC12	Complex Analysis and Special Functions	1.30	1.30		1.20											
AECC09	Analog and Pulse Circuits	1.80	1.70	1.80							1.80				1.50	
AECC10	Analog and Digital Communications	1.30	1.30	1.30							1.30					1.30
AECC11	Electromagnetic Waves and Transmission Lines	1.60	1.60	0.70							1.60					1.90
AECC12	IC Applications	1.10	1.10	1.00	1.20						1.10				1.10	
ACSC14	Experiential Engineering Education (ExEEed) - 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	
AECC13	Analog and Pulse Circuits Laboratory	3.00	3.00	3.00	3.00	3.00					3.00	3.00		3.00		
AECC14	Analog and Digital Communications Laboratory		3.00			3.00					3.00	3.00				3.00
AECC15	IC Applications Laboratory	3.00	3.00			3.00					3.00				3.00	
AHSC13	Business Economics and Financial Analysis	2.70	2.80						2.80	2.80		2.80				
AECC49	Digital design through Verilog	1.10	1.10	1.10	1.10	1.10									1.10	
AECC18	Antennas and Wave Propagation	2.00	2.00	2.00							2.50					1.70
AECC19	Microprocessors and Microcontrollers	1.40	1.60	1.60							1.50			0.70		



ACEC31	Disaster Management	2.70					2.80	2.70		2.80						
AECC64	Project Work (Phase - II)	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
<b>Direct Attainment Value</b>		<b>2.3</b>	<b>2.2</b>	<b>2.3</b>	<b>2.4</b>	<b>2.5</b>	<b>2.8</b>	<b>2.9</b>	<b>2.8</b>	<b>2.8</b>	<b>2.3</b>	<b>3</b>	<b>2.5</b>	<b>2.4</b>	<b>2.4</b>	<b>2.4</b>

### Overall Attainment

S No.	Assessment Component (Direct + Indirect)	Program 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)	2.3	2.2	2.3	2.4	2.5	2.8	2.9	2.8	2.8	2.3	3	2.5	2.4	2.4	2.4
2.	Student Program exit surveys (b)	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
3.	Employer surveys (c)	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
4.	Alumni Survey (d)	2.7	2.6	2.7	2.7	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
<b>Overall attainment = a*0.8 + b*0.1 + c*0.05 + d*0.05</b>		<b>2.3</b>	<b>2.2</b>	<b>2.3</b>	<b>2.4</b>	<b>2.5</b>	<b>2.7</b>	<b>2.8</b>	<b>2.7</b>	<b>2.7</b>	<b>2.3</b>	<b>2.9</b>	<b>2.2</b>	<b>2.4</b>	<b>2.4</b>	<b>2.4</b>

## Action taken to improve the attainment of Pos and PSOs:

POs	Target Level	Attainment Level	Observations
<b>PO1: Engineering Knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
<b>PO1</b>	<b>2.1</b>	<b>2.3</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> A few new NI ELVIS-II signals &amp; systems add on boards and NI ELVIS-III digital systems design boards have been purchased and their uses have been demonstrated during the theory classes of digital system design and signals and systems courses to help the students understand the utilization and functions of the NI ELVIS boards.</p> <p><b>Action 2:</b> It is advised to monitor the students at regular intervals during the lab session keenly to overcome the difficulty in doing the experiments and usage of Zynq-Zed development boards.</p> <p><b>Action 3:</b> Expert lectures on electronics devices &amp; circuits, signal &amp; system and integrated circuits applications have been arranged for the students to reinforce their knowledge about the application of the subject.</p>			
<b>PO2: Problem Analysis:</b> Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.			
<b>PO2</b>	<b>2.1</b>	<b>2.2</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Several new Moku Go multiple instrument kits have been acquired and the knowledge has been obtained and their applications have been illustrated throughout the theoretical sessions of signals and systems, analog and digital communications and digital system design courses to assist students in comprehending the applications and functionalities of the Moku Go multiple instruments.</p> <p><b>Action 2:</b> Problems focused on practical applications used electronic devices and circuits, digital system design, signals and systems to improve logical thinking.</p> <p><b>Action 3:</b> Tutorial sessions for the course Complex Analysis and Special Functions were enhanced.</p>			
<b>PO3: Design/development of Solutions:</b> 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.			
<b>PO3</b>	<b>2.1</b>	<b>2.3</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> A few new Tru IOT sensors have been procured, and the relevant knowledge has been disseminated. Their applications have been demonstrated during the theoretical sessions of the Internet of Things and embedded systems courses to enhancing students' understanding of the functionalities and uses of the Tru IOT sensors.</p> <p><b>Action 2:</b> Societal and environmental design problems were given as self-study to students in open elective courses.</p> <p><b>Action 3:</b> Industrial visits are expected to help students gain knowledge on complex engineering problems.</p>			

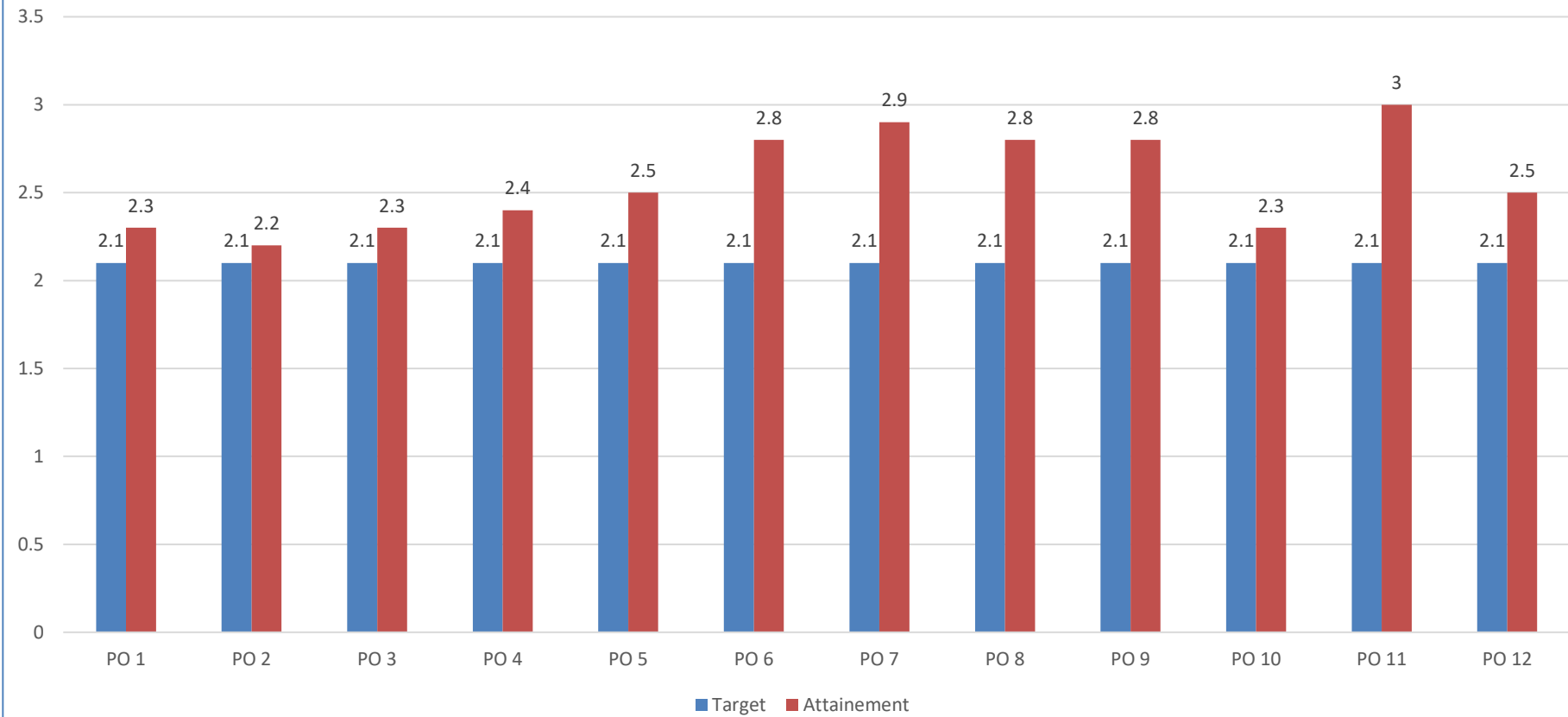
<b>PO4: Conduct Investigations of Complex Problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.			
<b>PO4</b>	<b>2.1</b>	<b>2.4</b>	Target is achieved. The following actions were taken to enhance the target level.
<b>Action 1:</b> Students are urged to engage in the creation of small experimental kits designed for instructional purposes for future cohorts and their peers. This involvement provides them with foundational experience in hardware implementation and experimentation, ultimately enhancing their productivity during their final year projects.			
<b>PO5: Modern Tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.			
<b>PO5</b>	<b>2.1</b>	<b>2.5</b>	Target is achieved. The following actions were taken to enhance the target level.
<b>Action 1:</b> Complex design problem using modern tool were given as assignment to the students in digital signal processing, digital image processing and embedded system design courses. <b>Action 2:</b> Workshops were organized focusing on various software applications pertinent to electronics and communication engineering, including 5G communications, PCB design, antenna design utilizing HFSS and Cadence. <b>Action 3:</b> Hands-on sessions on AWS Cloud platforms and MATLAB-simulink engineering tool were given to students to understand the concept of contemporary engineering and information technologies in engineering to designing and testing of system-on-chip (SoC) and integrated circuits (ICs).			
<b>PO6: The Engineer and Society:</b> 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.			
<b>PO6</b>	<b>2.1</b>	<b>2.8</b>	Target is achieved. The following actions were taken to enhance the target level.
<b>Action 1:</b> Student industry visits are promoted to enhance practical knowledge and address safety concerns and social dimensions, thereby fostering improved engineering practices. Additionally, the inclusion of certain mandatory humanities courses serves to continually reinforce the social responsibilities that electronics engineers must uphold. Besides this some mandatory humanities courses ensure that students are repeatedly reminded of their social responsibilities as electronics engineers.			
<b>PO7: Environment and Sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.			
<b>PO7</b>	<b>2.1</b>	<b>2.9</b>	Target is achieved. The following actions were taken to enhance the target level.
<b>Action 1:</b> Students are encouraged to indulge in projects, in which global and environmental issues are improved, with respect to consumption of energy and utilization of renewable energy resources. <b>Action 2:</b> Awareness programs on focusing the impact of electronic circuits on the environment will be implemented to foster a sustainable ecological framework. <b>Action 3:</b> Proper guidance were given to the students to implement renewable energy projects using optimized material that would guarantee sustainable development.			

<b>PO8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
<b>PO8</b>	<b>2.1</b>	<b>2.8</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Guest lectures were arranged on topics related to professional ethics / value based education.</p> <p><b>Action 2:</b> Online video links on ethical principles in electronics subjects were shared to students.</p> <p><b>Action 3:</b> Students were encouraged to get their major project and internship reports for plagiarism check to ensure proper practice of professional ethics.</p>			
<b>PO9 : Individual and Team Work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
<b>PO9</b>	<b>2.1</b>	<b>2.8</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> The institute organizes cultural events and alumni gatherings that invite students to participate as volunteer organizers. This initiative offers them an opportunity to engage both individually and collaboratively, thereby enhancing their skills in leadership and fostering a sense of teamwork</p> <p><b>Action 2:</b> Several students' professional chapter activities were organized to demonstrate their abilities as team members in a group.</p> <p><b>Action 3:</b> Students exhibited a strong inclination to collaborate in teams during their project work and internships.</p>			
<b>PO10: Communication:</b> 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.			
<b>PO10</b>	<b>2.1</b>	<b>2.3</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Students were given training to write effective reports and make effective presentations on projects undertaken.</p> <p><b>Action 2:</b> Students were encouraged to participate in class room presentations and national/international conferences/seminars/symposia/ hackathon / ideathon.</p> <p><b>Action 3:</b> Soft skills training is provided to students to improve multiple facets of communication and technical discussions through group discussions, presentations, and the acquisition of new knowledge. Frequent seminars and presentations are conducted to assist students in effectively conveying technical concepts.</p>			
<b>PO11: Project Management and Finance:</b> 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.			
<b>PO11</b>	<b>2.1</b>	<b>3</b>	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Students were encouraged to do multidisciplinary project involving allied departments.</p> <p><b>Action 2:</b> Students are made aware of management principles and project management practices. Additionally, with numerous management-oriented recruiters providing placement opportunities on campus, it is anticipated that students will come to understand the significance of management within the field of engineering.</p>			
<b>PO12:Life-long Learning:</b> 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.			
<b>PO12</b>	<b>2.1</b>	<b>2.5</b>	Target is achieved. The following actions were taken to enhance the target level.

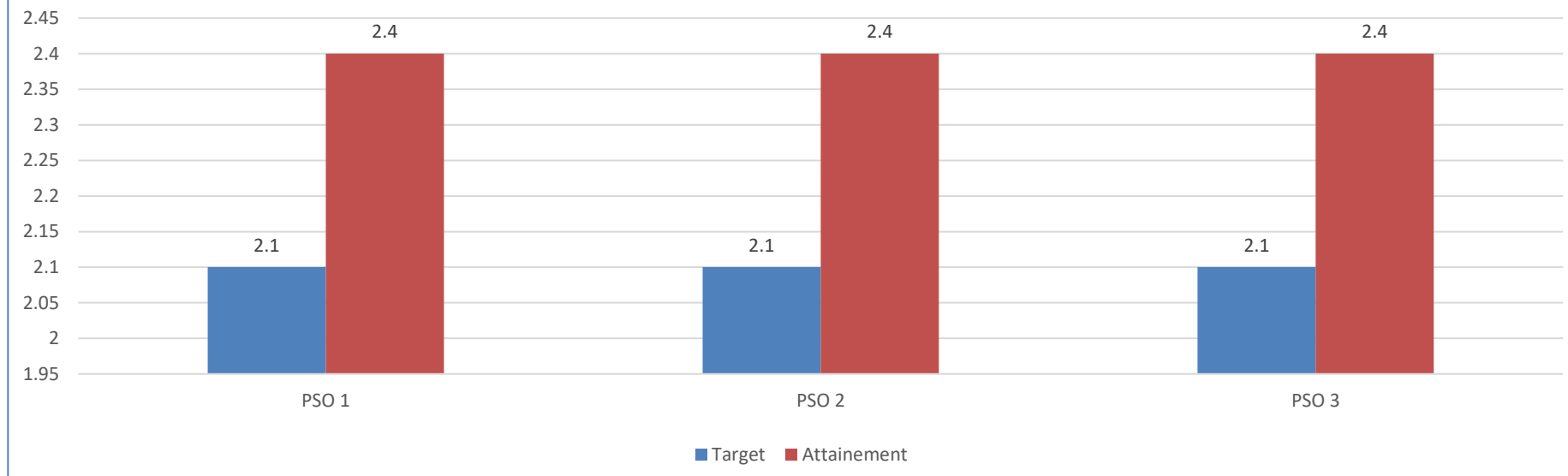
<p><b>Action 1:</b> The recent technology like 5G wireless communication, Nano materials, cyber security, Data science, Big data and artificial intelligence will be introduced to the students.</p> <p><b>Action 2:</b> Students were motivated to take up NPTEL certification on python, networking, RF design, communication, VLSI related subjects.</p> <p><b>Action 3:</b> Students were motivated to pursue higher studies in areas of wireless communication, RF design, semiconductor technology in premier institution.</p>			
<p><b>PSO1:</b> Build embedded software and digital circuit development platform for robotics, embedded systems and signal processing applications.</p>			
PSO1	2.1	2.4	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Students are encouraged to engage with real-world issues in their project work, enabling them to design, analyze, and develop solutions that provide exposure to cutting-edge technologies.</p> <p><b>Action 2:</b> Students were given design-oriented activities in emerging fields of electronics and communication engineering</p> <p><b>Action 3:</b> Students were encouraged to take up MOOC courses as part of co-curricular activities.</p>			
<p><b>PSO2:</b> Focus on the Application Specific Integrated Circuit (ASIC) Prototype designs, Virtual Instrumentation and System on Chip (SOC) designs.</p>			
PSO2	2.1	2.4	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Students are motivated to take up the real-life problems during their project work so that they can design, analyze, and find solution which gives exposure to latest technologies</p> <p><b>Action 2:</b> Students were advised to take up online NPTEL courses on basic engineering hardware and programming languages.</p>			
<p><b>PSO3:</b> Make use of high frequency structure simulator for modeling and evaluating the patch and smart antennas for wired and wireless communication applications.</p>			
PSO3	2.1	2.4	Target is achieved. The following actions were taken to enhance the target level.
<p><b>Action 1:</b> Workshops led by industry experts were organized to provide participants with practical experience using the latest hardware and software, facilitating real-time exposure to current technologies.</p> <p><b>Action 2:</b> Short term training program were conducted on program specific courses</p> <p><b>Action 3:</b> Students were encouraged to engage in industry-related projects to gain insight into advanced tools utilized in the field.</p>			



## Attainment of Program Outcomes (POs) of 2020 - 2024 batch



## Attainment of Program Specific Outcomes (PSOs) of 2020 - 2024 batch



  
Head of the Department

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