LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),

An ISO 21001:2018,14001:2015,50001:2018 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

POs & PSOs Attainment Levels and Actions for Improvement- AY 2024-25 (2021 Batch)

PO1- Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

Target (%)	Attained (%)	Observations
72	72	**Target attained.** It is observed that 52 courses are contributed to this PO1. Total 32 courses are above the target level for PO1. The courses like Probability & Statistics, applied physics, Discrete Mathematics Internship providing more contribution to reach the target of PO1.

Action 1: Motivate students to actively participate in technical events, to transform their theoretical knowledge into practical applications that meet the industry requirements.

Action 2: To instill strong coding skills among students, the department has introduced the Code Cracker Club, a dedicated platform designed to provide students with hands-on experience in coding and problem-solving. The club encourages students to explore various programming languages, participate in coding challenges, and collaborate on real-world projects, fostering a deep understanding of software development.

Action 3: The department has planned webinars and expert lectures from industry professionals on the latest technologies to enhance engineering knowledge.

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.

Target (%)	Attained (%)	Observations
71	70	**Target not attained** It is observed that 53 courses are contributed to this PO2. Some of the courses were slightly below target.

Action 1: Students are encouraged to observe real-life engineering problems to gain insights and explore potential approaches or solutions.

Action 2: The department encourages students to perform experiments beyond the syllabus using the Virtual Labs developed by IIT-Bombay.

Action 3: The department is actively conducting guest lectures to enhance students' problem analytical skills, providing them with the opportunity to gain insights from industry experts and academicians.

Action 4: The department is actively motivating students to enroll in online certification courses like AWS ,NPTEL Infosys Spring board, encouraging them to expand their knowledge beyond the classroom. These certifications not only enhance their technical skills

but also boost their employability and academic credentials.

Action 5: The department strongly encourage students to actively participate in departmental club activities for personal and professional growth.

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.

Target (%)	Attained (%)	Observations
71	71	**Target attained** It is observed that 42 courses are contributed to this PO3. Total 26 courses are above the target level for PO3 and target level is close to attained level. The courses like R Lab, software engineering, web application development module-II, Mean stack technologies etc. are higher attainment values in reaching the target of PO3.

Action 1: The department encourages students to propose innovative ideas and projects aimed at the welfare of society. By promoting such initiatives, the department helps students to develop solutions that address real-world challenges.

Action 2: The department will incorporate the Virtual Lab environment developed by IIT-Bombay into the curriculum, providing students with the opportunity to design and develop new simulators for academic purposes. This initiative aims to enhance students' programming skills by allowing them to work on real-world simulations and gain practical experience in coding & system design.

Action 3: The department strongly encourage students to take up multi-disciplinary projects, recognizing the importance of Inter-disciplinary collaboration in solving complex engineering challenges.

Action 4: The department actively encourages students to participate in various hackathons such as Smart India Hackathon, MSME Hackathon, providing them with a dynamic platform to challenge their creativity, enhance their technical skills, and apply their knowledge in solving real-world problems.

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.

Target (%)	Attained (%)	Observations
72	71	**Target not attained.** It is observed that 32 courses are contributed to this PO4. Total 22 courses are above the target level for PO4. However, found that nearly 10 courses are lower attainment than target level and target level is also too high

Action 1: Department being organized expert lectures on emerging areas to enhance the skill set of the students.

Action 2: In addition to the regular syllabus content, teachers will introduce research problems during tutorial and lab classes to expose students to real-world challenges & encourage critical thinking.

Action 3: The department encourages students to explore the analysis and interpretation of data as a vital component in selecting research-based project topics.

Action 4: The department has established the Machine Learning Club to enhance the students' capability to solve societal problems.

PO5-Moderen 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

Target (%)	Attained (%)	Observations
72	71	**Target not attained.** It is observed that 25 courses are contributed to this PO5. Total 16 courses are above the target level for PO5 and target level is very close to attained level. The courses like R Lab, web application development module-II, Mean stack technologies, Devops, Machine learning lab etc. are higher attainment values in reaching the target of PO5

Action 1: The department is actively encouraging students to enroll in courses such as Web Design using Django/Flask, MERN Stack, DEVOPs & Cyber Security to expand their knowledge and expertise in emerging fields of computer science. To support these initiatives, events are organized under the banner of the "Association of Computer Geeks (ACG)," a student association of the Computer Science and Engineering department.

Action 2: Expert lectures are arranged to keep students informed about the latest tools, techniques, and trends in the field of computer science and engineering.

Action 3: The department is planning to conduct various industry oriented certification programs, such as CISCO Microsoft, and Amazon AWS, to provide students with the opportunity to gain recognized qualifications in key technology areas.

Action 4: Introduce the Skelo platform for students to work on real-world applications, enabling practical problem-solving and experiential learning.

Action 5: The department conducts **two programming contests for every semester** to enhance coding skills, algorithmic thinking, and practical problem-solving.

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.

Target (%)	Attained (%)	Observations
76	74	**Target not attained.** It is observed that 12 courses are contributed to this PO6. Total 06 courses are above the target level for PO6. The courses like main project, Internship, soft Skills Lab, management science for engineers are contributed positively to attain the PO6.

Action 1: To enhance their understanding of safety concerns and social aspects in engineering, the department organizes industry visits / industry trainings that provide students with firsthand experience of how safety protocols, ethical considerations, and sustainable practices are implemented in real-world engineering settings.

Action 2: The department encourages students to actively participate in community service activities such as Swachh Bharat drives, blood donation camps, village visits, and voluntary teaching and mentoring of underprivileged children. The department believes that these experiences not only contribute to students' personal growth but also help them become responsible citizens and future leaders committed to social welfare.

Action 3: The department encourages students to actively participate in awareness programs on road safety, yoga, health, and hygiene.

Action 4: To enhance professional engineering practices, students are motivated to actively participate in the activities of professional society chapters.

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.

Target (%)	Attained (%)	Observations

71	**79**	**Target attained.** Total 11 curses are contributing towards the attainment of PO7. Out of 11 courses, 6 courses are strongly correlated and 2 courses are moderately and 3 courses are slightly correlated towards the PO7. Open elective courses like Renewable Energy sources, basics of civil engineering, disaster management are contributed positively to attain the PO7
Action 1: The department is organizing expert lectures to address critical environmental and sustainability issues in engineering. By attending these expert-led sessions, students will gain a deeper understanding of the significance of sustainability in the engineering field, learn how to design environmentally responsible solutions. **Action 2:** The department encourages students to engage in projects that focus on addressing global and environmental issues, with particular emphasis on energy consumption and the utilization of renewable energy resources. **Action 3:** The department encourages NSS activities like tree plantation to help students understand their responsibility towards the environment.		
PO8-Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.		
Target (%)	**Attained (%)**	**Observations**
69	**79**	**Target attained.** it is observed that only 25 courses are contributed to this PO8. Out of 25, 22 courses are contributed strongly towards the attainment of PO8. All laboratory courses are contributed positively to attain the PO8.
Action 1: Students are motivated and made aware about the demands of engineering profession, duties towards society & fellow human beings and importance of honesty and ethics. **Action 2:** The department organizes motivational programs to inspire and encourage students overcome challenges and prepare for their future careers. **Action 3:** The department encourages students to actively engage in co-curricular activities and sports to promote a commitment to ethical principles and an understanding that participation is more important than winning. This approach contributes to the overall development of students, helping them become well-rounded individuals who value collaboration, integrity, and personal achievement. **Action 4:** The department encourages students to attend awareness programs on Intellectual Property Rights (IPR) and Plagiarism. These programs are designed to educate students about the importance of protecting intellectual property, understanding copyright laws, and avoiding plagiarism in academic and professional work **Action 5:** The department ensures that ethical awareness is integrated into the curriculum (UHV 2: Understanding the Harmony), helping students recognize the importance of ethical decision-making in both their academic work and future professional careers.		
PO9-Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings		
Target (%)	**Attained (%)**	**Observations**
71	**79**	**Target attained.** it is observed that only 27 courses are contributed to this PO9. Out of 27, 23 courses are contributed strongly towards the attainment of PO9. All laboratory courses are contributed positively to attain the PO9.

Action 1: The department encourage students to or(ıize team activities, including group quizz(social & technical quizzes, and other collaborative events to promote teamwork, creativity, and intellectual engagement under Association of Computer Geeks(ACG).

Action 2: The institute hosts cultural programs and alumni meets where students are encouraged to volunteer as organizers. These events offer a platform for students to work both individually and in groups, helping them develop essential skills such as leadership and team spirit.

Action 3: The department encourage students to participate in teams for various technical events, such as hackathons, projects exhibitions and coding contests.

Action 4: Innovative teaching and learning methodologies, such as Think-Pair-Share and team assignments, have been implemented to nurture teamwork among students across multidisciplinary domains. These approaches foster a cooperative learning environment, enhancing students' ability to work effectively in teams, communicate across disciplines, and solve problems creatively.

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

Target (%)	Attained (%)	Observations
73	77	**Target attained.** It is observed that only 27 courses are contributed to this PO10. Out of 27, 21 courses are contributed strongly towards the attainment of PO10. All laboratory courses are contributed positively to attain the PO10

Action 1: To help students use the English language more effectively in writing reports, notes, and summaries, the department organizes soft skills training programs conducted by both in-house experts and external professionals.

Action 2: The department encourages students to actively participate in intercollegiate competitions and publish technical articles. By engaging in these activities, students broaden their horizons, develop critical thinking, and build a strong foundation for future academic and career achievements.

Action 3: The department encourages students to enroll in Business English Certificate (BEC) certification courses offered by Cambridge English, NPTEL & Pearson. These courses are designed to enhance students' proficiency in English, focusing on language skills essential for professional and workplace communication.

Action 4: The department has introduced a Professional Communication course & Soft skills lab as a mandatory part of the curriculum. This course aims to enhance students' communication skills, focusing on both written and verbal proficiency required in professional settings.

Action 5: The department organizes soft skills training programs to enhance students' communication and presentation skills. These programs focus on improving verbal and non-verbal communication, building confidence, and developing the ability to deliver impactful presentations.

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.

Target (%)	Attained (%)	Observations
74	74	**Target attained.** It is observed that only 07 courses are contributed to this PO11. Out of 7, 5 courses are contributed

		strongly towards the attainment of PO11. Courses like software engineering, software engineering lab, software project management, main project is positively contributed to attain the PO11

Action 1: To enhance project management skills among students, the department plans to include courses such as Management Science for Engineers based on feedback from industry and academia.
Action 2: Courses relevant project management practices are regularly revised and upgraded to align with the latest techniques, tools, and trends in the field. This ensures that students are equipped with contemporary knowledge and skills, including strategic planning, resource allocation, risk assessment, and leadership.
Action 3: Students are encouraged to prepare comprehensive project reports under the guidance of faculty, with a focus on achieving outcomes such as paper publications, project submissions, and patent applications.
Action 4: Students are motivated to take quality internships that provide them with valuable real-world experience and practical skills. The department encourages students to seek internships that align with their academic interests and career aspirations, ensuring they gain exposure to industry practices, workplace dynamics, and cutting-edge technologies.

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.

Target (%)	Attained (%)	Observations
73	71	**Target not attained.** It is found 37 courses are contributing to this PO12. Out of 37, 18 courses are attained more than 75% with respect to PO12. Continuous motivation on higher studies and self-learning like MOOCS, NPTEL, and Course Era will be planned to strengthen to the attainment of this PO12.

Action 1: The department encourages practical training and internships, which provide students with valuable opportunities to work on independent projects in an industrial setting under limited mentorship. This hands-on experience helps students apply their theoretical knowledge to real-world challenges, allowing them to develop critical skills such as problem-solving, decision-making, and time management.
Action 2: The department will constantly encourage students to register for NPTEL courses to further enhance both their theoretical knowledge and practical experience. NPTEL offers a wide range of online courses from leading institutions, covering various technical and non-technical subjects.
Action 3: The department encourages students to embrace lifelong learning by actively participating in various events organized by outside colleges and institutions. These events, including workshops, seminars, conferences, and competitions, provide students with exposure to new ideas, technologies, and trends beyond the classroom.

PROGRAM SPECIFIC OUTCOMES

PSO1-The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization

Target (%)	Attained (%)	Observations
71	70	**Target is not attained.** It is observed that 28 courses are contributed to this PSO1. Total 16 courses are above the target level for PSO1 and target level is very close to attained level. The courses like software engineering, PPSC , R lab, web application development etc. are positively contributed to attain the PSO1.

Action 1: Students are motivated to undertake assignments and analyse case studies as part of their learning process to solve real-time problems.

Action 2: Extra classes were conducted to improve software engineering fundamentals for weak students. These extra classes aim to build students' confidence, enhance their problem-solving abilities, and prepare them for more advanced coursework, ultimately helping them achieve academic success.

Action 3: The department provides platforms like Skelo, Hacker Rank to enhance students' coding abilities, develop logical thinking, and approach problems systematically. These platforms offer a wide range of resources and tools that enable students to practice coding, solve algorithmic challenges, and engage in hands-on learning

PSO2-The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

Target (%)	Attained (%)	Observation
74	74	**Target attained.** It is observed that 26 courses are contributed to this PSO2. Total 12 courses are above the target level for PSO2 and target level is very close to attained level. The courses like DBMS, Big data analytics, information security, computer networks are lower attainment than target level.

Action 1: Department will train the faculty and students together for enhancing their skills on real-time problems. The following courses will be incorporating to meet the industry requirements:

- Industrial IoT 4.0
- Digital Image Processing
- Deep Learning & Natural Language Processing
- Symbolic Logic and Automated Reasoning
- Blockchain Technology
- Cloud Computing (AWS, Azure, GCP)

Action 2: The department organized hands-on sessions focused on emerging technologies such as MEAN Stack development, Android application development & IoT. These sessions provide practical experience to enhance the skills of students.

PSO3-To inculcate an ability to analyze, design and implement database applications.

Target (%)	Attained (%)	Observation
74	73	**Target is not attained.**

		It is observed that 16 courses are contributed to this PSO3. Total 8 courses are above the target level for PSO3 and target level is very close to attained level. The courses like DBMS, DMDW,BDA are lower attainment than average attainment level.

Action 1: To strengthen the domain knowledge and make them job ready graduates, department is planning to introduce a greater number of professional elective courses.

Action 2: The department has Memorandums of Understanding (MoUs) with various Software companies to provide students with exposure to cutting-edge computer engineering techniques. Through these collaborations, students will have the opportunity to learn and work with modern technologies such as Artificial Intelligence (AI), Machine Learning (ML), Amazon Web Services (AWS) Cloud, and Procedural Language Extension to Structured Query Language (PL/SQL).

Action 3: Extra classes were conducted to improve engineering fundamentals for weak students.

HOD, CSE

9/9/2025

Department of Computer Science & Engineering
Lakireddy Balireddy College of Engineering
MYLAVARAM-521 230, A.P. INDIA