



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(Autonomous)

Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada  
Accredited by NAAC with "A" Grade and NBA (CSE, IT, ECE, EEE & ME) under Tier - I



## Attainment of POs, PSOs & ATR

(Graduated Batch: 2023)

Department: Mechanical Engineering

S.No.	POs/ PSOs	Target (%)	Attainment (%)	ATR
1.	PO1	75	71.7	Target not reached. Unit wise questions are to be allotted to the average set of students in the class to solve the provided random questions.
2.	PO2	70	70.4	Target reached.
3.	PO3	70	71.1	Target reached.
4.	PO4	75	71.3	Target not reached. Skill oriented courses are to be introduced. Make the students to conduct the experiments individually in laboratories.
5.	PO5	75	71.8	Target not reached. Skill oriented course on C-Programming, Data structures, Java Programming, Python Programming CATIA, and ANSYS workshops are to be conducted.
6.	PO6	70	70.7	Target reached. Encourage the students in participate in social service activities, Intercollegiate participation in conferences, sports are to be improved. More number of students are to be encouraged for community service oriented projects and NSS activities.
7.	PO7	70	68.4	Target not reached. Environmental oriented workshops are to be conducted. Activities in environmental clubs are encouraged.
8.	PO8	70	65.7	Target not reached. Ethical and soft skills issue related guest lectures are to be conducted.
9.	PO9	70	67.7	Target not reached. Motivate the students for AICTE quality internships, in-house trainings individual course seminars, association activities are to be assigned to the students.
10.	PO10	75	71.8	Target not reached. Group discussions are done in labs. Universal human values contents are to be discussed.
11.	PO11	70	67.5	Target not reached. Cost analysis is to be included in the project works. NPTEL Registrations in Project management is encouraged.
12.	PO12	70	68.1	Target not reached. NPTEL, Coursera, Tutorial and assignment works are to be assigned to the students.
13.	PSO1	75	71.4	Target not reached. Thermal module workshops like Design of Electric vehicles are conducted.
14.	PSO2	75	71.5	Target not reached. Industrial and community service projects are encouraged.
15.	PSO3	75	71.1	Target not reached. Design and model oriented projects are to be prepared.

Note: It is the front page of Analysis of Attainment of POs, PSOs and ATR. In addition to front page send me the complete analysis report (As per NBA format).

Date  
31-07-2023

*M. B. S. Reddy*  
Name & Signature

HEAD

Dept. of Mechanical Engineering  
LAKIREDDY BALI REDDY COLLEGE OF ENGG.  
MYLAVARAM-521 230. KRISHNA DT A.P





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(AUTONOMOUS)**

**DEPARTMENT OF MECHANICAL ENGINEERING**

Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,  
NAAC & NBA Accredited Certified by ISO 9001:2015

**Program Assessment Committee (PAC)**

**Regulation (R17)**

ATR on POs and PSOs attainments of 2019-23 Batch

A.Y:2022-23

POs	Target Level (%)	Attainment Level (%)	Observations
<p><b>PO1: Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering, Fundamentals and an engineering specialization to the solution of complex engineering problems.</p>			
	75	71.77	<p><b>Target not reached.</b> Total of 54 courses are contributing to this PO1. 6 courses are identified as less than 60% PO attainment. Mechanics of solids Metallurgy and Material science lab Kinematics of Machines Mechanical Engineering Design 1 Dynamics of Machines Machine tools and dynamics lab</p>
<p><b>Action 1:</b> For problematic courses, it is suggested to solve more problems in class room. <b>Action 2:</b> Assign unit wise questions to average students and make to them to solve in class room. <b>Action 3:</b> Assign group tasks in laboratories to improve the learning methodology.</p>			
<p><b>PO2: Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.</p>			
	70	70.4	<p><b>Target marginally reached.</b> Total of 50 courses are contributing to this PO2. 9 courses are identified as less than 60% PO attainment. Mechanics of Solids Metallurgy and Material Science lab Kinematics of Machines Mechanical Engineering Design 1 Dynamics of Machines Machine Tools and Dynamics lab Mini Project Seminar</p>
<p><b>Action 1:</b> Prepare separate analysis level questions in problematic courses.</p>			



	<p><b>Action 2:</b> Complex problems and its analysis are practiced for few courses in the classroom through the tutorials/Assignment problems.</p> <p><b>Action 3:</b> Gained knowledge on complex engineering problems and solutions by sending the students to various industries and encouraging the students to do industrial internships.</p> <p><b>Action 4:</b> It is suggested to incorporate experiments beyond the syllabus (lab courses) with research based knowledge.</p>		
<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.</p>			
	70	71.1	<p><b>Target reached.</b></p> <p>Total of 46 courses are contributing to this PO3.</p> <p>10courses are identified as less than 60% PO attainment.</p>
<p><b>Action 1:</b> Encourage students to use e-content and video lectures available in public domain and improve skill set in design and development of various systems.</p> <p><b>Action 2:</b> Design oriented problems are to be solved in Project based Learning and mini projects to develop skills on design/ development solutions.</p> <p><b>Action 3:</b> Encourage students to participate in design contests.</p>			
<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.</p>			
	75	71.3	<p><b>Target not reached.</b></p> <p>Total of 46 courses are contributing to this PO4.</p> <p>6 courses are identified as less than 60% PO attainment.</p> <p>Teaching methodology is to be improved in courses like Renewable energy sources, CAD/CAM, Heat Transfer, MD-1, DOM, KOM, Thermal Engineering, EEE and Thermodynamics</p>
<p><b>Action 1:</b> For the courses with attainments less than the target, the faculty are requested to use appropriate pedagogical techniques and improve the target.</p> <p><b>Action 2:</b> Investigation of complex problems using software tools and the implementation of skill-oriented programs could be improving the skill set of graduates to solve complex design problems.</p> <p><b>Action 3:</b> Technical events are to be organized to improve skills on solving real world problems (Lakshya/ ISHRAE etc are organized)</p> <p><b>Action 4:</b> Lab courses like Metallurgy and Material science and Dassault Systemes and ANSYS Lab) beyond syllabus experiments were performed in order to enhance research-based skills.</p>			
<p><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</p>			



activities with an understanding of the limitations.			
	75	71.8	<p><b>Target not reached.</b></p> <p>Total of 11 courses are contributing to this PO5.</p> <p>It is found very few courses are contributed to the attainment of PO5. Courses like, CAD/CAM, CAD/CAM Lab, Mini project and main project, Internship strongly contributing to this PO5. These courses attainment values are more than the target level of PO5.</p>
<p><b>Action 1:</b> Conduct workshop on CFD Modelling &amp; Analysis More Simulations with software tools like CATIA, MATLAB, ANSYS etc and Skill Level experiment, targeting complex Engineering Problems to be introduced in the above said courses.</p> <p><b>Action 2:</b> Some video lectures are to be given based on the criticality of the courses in software tool usage.</p> <p><b>Action 3:</b> Solve the theory course problems using software tools.</p> <p><b>Action 4:</b> Suggested to conduct value added courses on latest software tools.</p> <p><b>Action 5:</b> Encourage students to use modern tools in problem based learning, and in mini projects.</p>			
<p><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.</p>			
	70	70.7	<p><b>Target reached.</b></p> <p>Total of 15 courses are contributing to this PO6.</p> <p>3 Courses are contributing less than 60% of the attainment values.</p> <p>The courses like main project, Internship, mini project, Communication and Presentation Skills Lab, Seminar and Robotics are contributed positively to attain the PO6.</p>
<p><b>Action 1:</b> Students are motivated to participate various programs to acquire and develop skills to solve societal issues.</p> <p><b>Action 2:</b> More number of student participation in attending co-curricular and extracurricular activities.</p> <p><b>Action 3:</b> Suggested to develop the society utility projects.</p> <p><b>Action 4:</b> Motivate the students to participate in societal activities through NSS, Blood Donation Camps and other Student Clubs to understand the problems in the society and the courses like Environmental science are included in curriculum to enrich their understanding of the society.</p>			
<p><b>PO 7: 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.</p>			
	70	68.4	<p><b>Target not reached.</b></p> <p>Total of 19 courses are contributing to this</p>



			<p>PO7. 3 Courses are contributing less than 60% of the attainment values.          Courses like Thermodynamics, Thermal Engineering and Renewable Energy sources are lower attainment value than the target value of 70.</p>
	<p><b>Action 1:</b> Students are motivated to acquire the knowledge on environment and sustainability issues by attending the various events organized by the inter-institutes.  <b>Action 2:</b> Students are encouraged to do projects on alternate fuels. Workshops on Renewable Energy, Sustainable Engineering Designs were conducted for inculcating thoughts on Sustainable Development.  <b>Action 3:</b> Courses like Environmental science are included in curriculum to enrich their understanding of the society.</p>		
<p><b>PO 8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.</p>			
	70	65.7	<p><b>Target not reached.</b>          Total of 11 courses are contributing to this PO8. Only one course is contributing less than 60% of the attainment values.</p>
	<p><b>Action 1:</b> Professional Ethics and Human Values is the course added to academic curriculum. Encouraging more students to participate more on sports and cultural activities.  <b>Action 2:</b> While solving the engineering practice-oriented problems graduates have to follow the code of ethics.  <b>Action 3:</b> Improve the ethical principles and methodology in the contributed courses like main project, mini project, laboratories, and internship.  <b>Action 4:</b> Technical Societies like ISHRAE, ISTE and Automobile club are started and conducted few programs to ensure Ethical practices in Engineering</p>		
<p><b>PO 9: Individual and teamwork:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.</p>			
	70	67.7	<p><b>Target not reached.</b>          Total of 22 courses are contributing to this PO9. Only one course is contributing less than 60% of the attainment values.          Only two courses are contributing less than 60%.          Individual performance is to be improved in Seminar, Communication and Presentation Skills Lab, Mini project, main project, Internship, Comprehensive Viva-Voce courses are positively contributed in the attainment of PO9.</p>
	<p><b>Action 1:</b> Increasing emphasis on seminars/ group discussions and to carry out the lab experiments individually or in some cases as team members.  <b>Action 2:</b> Students will be encouraged to organize and participate in technical events</p>		



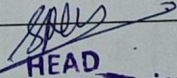
			to improve their leadership personal development. <b>Action 3:</b> Encourage students to participate in association activities.
<b>PO 10: Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.			
	75	71.8	<b>Target not reached.</b> It is observed that a total of 20 courses are contributing to this PO10. Only 4 courses are contributing less than 60%. Courses like Seminar, Mini project, Internship and Comprehensive Viva-Voce and main project are contributed positively to meeting the target of PO 10.
<p><b>Action 1:</b> Change the delivery content like involving the more students in interaction/group discussion to improve the communication skill of the students.</p> <p><b>Action 2:</b> Soft skill training is imparted to students to enhance various aspects of communication or technical talks by group discussion, presentation, and new learning outcomes.</p> <p><b>Action 3:</b> Continuous assessment of Mini-Projects, Internship PAL, PBL and Main Projects given to the students will help them to improve their communication, presentation and report writing skills.</p> <p><b>Action 4:</b> Seminars and training programs on communication, presentation skill will be arranged for the students.</p>			
<b>PO 11: 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.			
	70	68.5	<b>Target not reached.</b> Total of 9 courses are contributing to this PO11. Only 2 courses are contributing less than 60% of the attainment values. Cost analysis report is to be included in the courses such as Internship, Operation Research, Mini Project and project works
<p><b>Action 1:</b> Impart the knowledge and understanding of the engineering and management principles to work out projects on multidisciplinary environments.</p> <p><b>Action 2:</b> Select internship activities based on the work, as a member and leader in a team to acquire the knowledge of project management principles and finance.</p> <p><b>Action 3:</b> Improve the teaching –learning process for the identified courses. Seminars are conducted through Entrepreneurship Development Cell on Project Management.</p> <p><b>Action 4:</b> Students are encouraged to do multidisciplinary projects.</p>			
<b>PO 12: 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.			
	70	68.1	<b>Target not reached.</b> It is observed that a total of 49 courses are



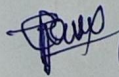
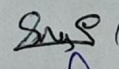
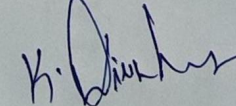
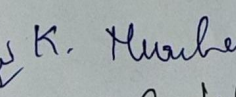
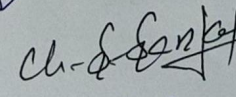
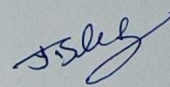
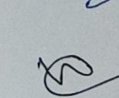
			<p>contributing to this PO12. Only 6 courses are contributing less than 60%.          Continuous motivation on higher studies and self-learning like MOOCS, NPTEL, and Course Era will be planned to strengthen to the attainment of this PO12.</p>
<p><b>Action 1:</b> Encourage/Motivate the students about the lifelong learning approach through alumni interactions, invited keynote presentation from the academic experts.  <b>Action 2:</b> Inculcate the students to develop the habit of self-preparation and life is nothing but learning new information.  <b>Action 3:</b> LAKSHYA an annual event conducting to encourages students to expose Lifelong Learning.  <b>Action 4:</b> Association Activities are conducting to develop critical thinking Self-learning modules through SWAYAM &amp; NPTEL courses are introduced to the students for inculcating the spirit of Continuing education.  <b>Action 5:</b> Department conducting technical training/GATE classes for the graduates to motivate the students towards higher education and lifelong learning.</p>			
<p><b>PSO 1: To apply the principles of thermal sciences to design and develop various thermal systems.</b></p>			
	75	71.4	<p><b>Target not reached.</b>          It is observed that a total of 27 courses are contributing to this PSO1. Only 6 courses are contributing less than 70%.</p>
<p><b>Action 1:</b> Improve the teaching methodology as well as providing more assignments related to the thermal stream courses such as TD, FMHM, ATD, HT and R&amp;AC may help in improvement of the PSO1 attainment.  <b>Action 2:</b> Motivate the graduates to make design and development of various thermal systems/products by applying the basic principles of thermal sciences.  <b>Action 3:</b></p>			
<p><b>PSO 2: To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis, and manufacturability of products.</b></p>			
	75	71.5	<p><b>Target not reached.</b>          It is observed that a total of 32 courses are contributing to this PSO2. Only 5 courses are contributing less than 60%.          Mechanics of solids          Metallurgy and Material Science lab          Machine tools and Dynamics lab          Dynamics of Machines          Mechanical Engineering Design</p>
<p><b>Action 1:</b> Provide some videos as well as power point presentations for improving the teaching learning process for the above identified courses to improve its attainment level.  <b>Action 2:</b> Apply tribological procedures for finding the microstructures of wear and</p>			



	tear of machinery components. <b>Action 3:</b> Provide industrial tours related to the production industries to improve the practical upstanding level of the identified courses as well as arrange guest lecture from the industry experts.	
<b>PSO 3: To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.</b>		
	75	<b>Target not reached.</b> It is observed that a total of 37 courses are contributing to this PSO3. 7 courses are contributing less than 60% PO Attainment. Mechanics of Solids Metallurgy and Material Science lab Kinematics of Machines Computer aided machine drawing lab Mechanical Engineering Design-1 Dynamics of Machines Machine tools and Dynamics lab
<b>Action 1:</b> Instructing the design faculty members to conduct the design-oriented project works relating to transmission of motion and power. <b>Action 2:</b> Planned to conduct design contests and competitions for the students regularly. <b>Action 3:</b> Faculty should implement various pedagogical techniques to focus on higher cognitive level problems and its relevant analysis in the classrooms.		

  
**HEAD**  
 Dept of Mechanical Engineering  
 Lakshmi Narayan Reddy College of Engineering  
 Lakshmi Narayan Reddy College of Engineering  
 MYLAVARAM-521 230., KRISHNA DT, A.P.  
**HOD**

PAC Signatures

- 1)  (Dr. P. RAVINDRA KUMAR)
- 2)  (S. S. Reddy (Jr))
- 3)  (Dr. K. DILIP KUMAR)
- 4)  (Dr. Ch. Siva Sankar Babu)
- 5)  (Ch. Sankar Babu)
- 6)  (J. S. REDDY)
- 7)  (V. Srinivas Kumar)