



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B.Reddy Nagar, Mylavaram – 521 230, N.T.R. District, Andhra Pradesh, India
Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi
Accredited by NBA under Tier - I, Accredited by NAAC
An ISO 21001:2018, 500001:2018, 14001:2015 Certified Institution
DEPARTMENT OF AEROSPACE ENGINEERING
Estd.: 1998 Website: <https://www.lbrce.ac.in/ase/index.php> Email: hodaero@lbrce.ac.in Phone:08659-222933 Ext:624/623

RECOMMENDATIONS/SUGGESTIONS REPORT

PO/PSOATTAINMENTS

Batch: 2020-2024

A.Y:2024-25

POs	Target Level (%)	Attainment Level (%)	Observations
PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO1	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 42 courses are contributing towards PO1. Out of 42 courses, 17 courses are above the PO target level.
	65	61	
	Action 1: Courses with a PO attainment below 65% have been identified, namely Strength of Materials, Introduction to Computational Fluid Dynamics, Elements of Communication Systems, Aircraft Structures-I, Aircraft Structures-II, Space Mechanics, Linear Control Systems, Aerospace Materials and Manufacturing, Finite Element Methods in Engineering and Elements of Heat Transfer. These findings have been communicated to the respective course coordinators via module coordinators. Suggestions for necessary improvements in the teaching-learning methodology have been recommended to enhance PO attainment for upcoming batches. Action 2: Enhancing problem-solving skills in aerospace-specific courses such as Strength of Materials, Computational Fluid Dynamics, and Aircraft Structures by conducting rigorous numerical practice and simulation-based learning. Action 3: Incorporating advanced computational tools for aerodynamics and propulsion analysis to reinforce theoretical concepts with practical applications.		
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	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 42 courses are contributing towards PO2. Out of 42 courses, 18 courses are above the PO target.
	65	61	
	Action 1: Courses with a PO attainment below 65% have been identified, including Strength of Materials, Introduction to Computational Fluid Dynamics, Elements of Communication Systems, Space Mechanics, Aircraft Structures-I, Aircraft Structures-II, Linear Control Systems, Aerospace Materials and Manufacturing, Finite Element Methods in Engineering		

	and Elements of Heat Transfer. This information has been communicated to the respective course coordinators through module coordinators. Suggestions for necessary improvements in the teaching-learning methodology have been provided for the aforementioned courses to enhance PO attainment in future batches. Action 2: Conducting industry-oriented case studies on real aerospace failures and success stories to develop critical thinking skills. Action 3: Strengthening mathematical modeling and experimental validation techniques for aerospace applications by engaging students in research-oriented projects.		
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	Target Level (%)	Attainment Level (%)	Target reached
	60	62	Out of 43 courses, 38 courses are contributing towards PO3. Out of 38 courses, 28 courses are above the PO target.
	Action 1: Courses with a PO attainment below 65%, including Strength of Materials, Introduction to Computational Fluid Dynamics, Elements of Communication Systems, Aircraft Structures-I, Aircraft Structures-II, Linear Control Systems, Aerospace Materials and Manufacturing, Space Mechanics, and Finite Element Methods in Engineering have been identified. These details have been forwarded to the respective course coordinators through module coordinators. Recommendations for necessary improvements in the teaching-learning methodology have been made for the aforementioned courses to enhance PO attainment in upcoming batches. Action 2: Encouraging students to work on aerospace design projects, including UAVs, propulsion systems, and composite structures. Introduce new electives focusing on computational methods for aerospace structural analysis and fluid dynamics. Action 3: PAC members have been instructed to identify new courses or electives that can better contribute to PO attainment. Additionally, students are encouraged to opt for these courses.		
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	Target Level (%)	Attainment Level (%)	Target reached
	60	62	Out of 43 courses, 41 courses are contributing towards PO4. Out of 41 courses, 31 courses are above the PO target.
	Action 1: The course and module coordinators are instructed to focus on improving the conduct of problematic courses, particularly in labs, to enhance the attainment level of PO4. Action 2: Improving laboratory experiences by integrating wind tunnel testing, structural load analysis, and propulsion system performance evaluation. Action 3: Facilitating student participation in national and international aerospace research competitions to foster investigative skills.		

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	Target Level (%)	Attainment Level (%)	Target reached
	60	66	Out of 43 courses, 10 courses are contributing toward PO5. Out of 10 courses, 9 courses are above the PO target
	Action 1: Create case studies or solve numerical problems using freely available software tools like AutoCAD, CATIA, PRO-E, and ANSYS to encourage graduates to utilize modern tools in their academic endeavors. Action 2: Training students in industry-standard software such as ANSYS, CATIA, MATLAB, and Open FOAM for aerospace engineering applications. Action 3: Developing hands-on workshops on finite element analysis (FEA) and computational fluid dynamics (CFD) for real-world problem-solving. Action 4: Instructed to engage in watching video lectures and participating in MOOCs related to the usage of 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.			
	Target Level (%)	Attainment Level (%)	
PO6	65	60	Target not reached Out of 43 courses, only 03 courses are contributing toward PO6. Out of 3 courses, 1course are above the PO target.
	Action 1: Courses with a PO attainment below 65%, such as Elements of Heat Transfer, have been identified. These details have been forwarded to the respective course coordinators through the module coordinators. Recommendations for necessary improvements in the teaching-learning methodology have been made for the aforementioned courses to enhance PO attainment in upcoming batches. Action 2: Encouraging participation in outreach programs focused on aviation safety, sustainability, and the impact of aerospace engineering on society. Action 3: Organizing guest lectures on regulatory frameworks such as DGCA, FAA, and EASA compliance for aerospace engineers.		
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	Target Level (%)	Attainment Level (%)	Target not reached
	65	59	Out of 43 courses, only 02 courses is contributing toward PO7 and is below the target.
	Action 1: Faculty members are directed to incorporate lessons on engineers' responsibilities towards the environment into their teaching methodologies. Action 2: Integrating sustainable aviation fuel (SAF) research and green propulsion technologies into the curriculum.		

	Action 3: Conducting projects focusing on reducing carbon footprints in the aerospace industry.		
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
PO8	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, only 03 courses are contributing toward PO8 and is below the target.
	65	59	
	Action 1: Organizing seminars on ethical considerations in aircraft design, manufacturing, and maintenance. Action 2: Conducting workshops on aerospace industry standards and regulations to instill professional responsibility. Action 3: Arrangements will be made for industry expert talks to heighten awareness of the code of ethics in the design and deployment of aircraft components.		
PO9: Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
PO9	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 04 courses are contributing toward PO9. Out of 04 courses, 01 course is above the PO target.
	65	61	
	Action 1: Courses with a PO attainment below 65%, including Universal Human Values 2: Understanding Harmony, Problem Solving Using Python, Basic Electrical and Electronics Engineering Lab have been identified. These details have been forwarded to the respective course coordinators through the module coordinators. Recommendations for necessary improvements in the teaching-learning methodology have been made for the aforementioned courses to enhance PO attainment in forthcoming batches. Action 2: Facilitating teamwork-based design projects such as aircraft configuration studies and propulsion system development. Action 3: Encouraging participation in global aerospace competitions like SAE Aero Design and AIAA Design Competitions.		
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	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 04 courses are contributing towards PO10. Out of 04 courses, 01 courses are above the PO target.
	65	62	
	Action 1: Courses with a PO attainment below 65%, such Universal Human Values 2: Understanding Harmony, Problem Solving Using Python, Basic Electrical and Electronics Engineering Lab, have been identified. These details have been communicated to the respective course coordinators through the module coordinators. Recommendations for necessary improvements in the teaching-learning methodology have been made for the aforementioned courses to enhance PO attainment in forthcoming batches. Action 2: Adjustments to the delivery content, such as increasing student involvement in		

	interaction and group discussions, aim to enhance students' communication skills. Action 3: Conducting technical report writing and aerospace-specific presentation training for improved documentation skills. Action 4: Providing opportunities for students to present research findings at aerospace conferences and seminars.		
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	Target Level (%)	Attainment Level (%)	Target reached Out of 43 courses, 01 courses are contributing toward PO11 and is above the target level.
	60	66	
	Action 1: Introducing aerospace project management case studies to develop cost estimation and resource planning skills. Action 2: Choose internship opportunities that involve working as both a team member and leader to gain insight into project management principles and financial aspects. Action 3: Encouraging internships in aerospace firms to understand project execution and budgeting in industry settings.		
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	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 42 courses are contributing toward PO12. Out of 42 courses, 17 courses are above the PO target.
	65	60	
	Action 1: Instill in students the importance of self-preparation and self-directed learning through various resources such as textbooks, journals, print and electronic media, as well as NPTEL videos. Action 2: Faculty members are tasked with emphasizing the significance of core courses in fostering lifelong learning. Action 3: Promoting participation in online certification courses such as NPTEL, Coursera, and edX on advanced aerospace topics. Action 4: Conducting GATE and GRE preparation sessions to help students pursue higher studies in aerospace engineering.		

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures, and Flight Dynamics in Aerospace vehicle design.			
PSO1	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 38 courses are contributing towards PSO1. Out of 38 courses, 17 courses are above the PO target value of 65%.
	65	61	
	Action 1: Enhancing teaching methodologies and increasing the number of assignments related to courses such as Strength of Materials, Introduction to Computational Fluid Dynamics, Aircraft Structures-II, Elements of Communication Systems, Aircraft Structures-I, Linear Control Systems, Aerospace Materials and Manufacturing, Space Mechanics, Finite Element Methods in Engineering, Elements of Heat Transfer, and Flight Dynamics may contribute to improving PSO1 attainment. It is recommended that the PAC and DAC review the course content of those courses that have not met the target and suggest necessary measures to the MCC. Action 2: Strengthening understanding of aerodynamics, propulsion, and structures by implementing advanced simulation-based learning. Action 3: Addressing application-oriented problems in core subjects is crucial to improving understanding in Aerodynamics, Propulsion, Aircraft Structures, and Flight Dynamics. Action 4: Encouraging hands-on research in wind tunnel testing, composite material testing, and propulsion system design.		
PSO2: To prepare the students to work effectively in Aerospace and Allied Engineering organizations.			
PSO2	Target Level (%)	Attainment Level (%)	Target not reached Out of 43 courses, 34 courses are contributing towards PSO2. Out of 34 course, 16 courses are above the PO target value of 65%.
	65	61	
	Action 1: Students are urged to pursue internships at leading defense development organizations to gain experience and explore defense, space research programs, and aerospace-related industries. Action 2:Enhancing teaching methodologies and increasing the number of assignments related to courses such as Strength of Materials, Introduction to Computational Fluid Dynamics, Aircraft Structures-I, Aircraft Structures-II, Linear Control Systems, Aerospace Materials and Manufacturing, Space Mechanics, Finite Element Methods in Engineering and Flight Dynamics may contribute to improving PSO1 attainment. It is recommended that the PAC and DAC review the course content of those courses that have not met the target and suggest necessary measures to the MCC. Action 3: Faculty members should employ various pedagogical techniques to emphasize higher cognitive level problems and their analysis in classroom settings. Action 4: Facilitating industrial visits and collaborations with organizations like ISRO, DRDO, and HAL to enhance practical exposure.		

Program Coordinator(s)

Head of the Department