



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)

L.B. Reddy Nagar, Mylavaram-521 230. Andhra Pradesh, INDIA  
Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi  
NAAC Accredited with "B++" grade, Accredited by NBA,  
New Delhi & Certified by ISO 9001:2015, <http://www.lbrce.ac.in>

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

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Date: 05-06-2019

There will be a meeting of Department Academic Committee (DAC) and Program Assessment Committee (PAC) on 7<sup>th</sup> June 2019 from 2:00 PM onwards to assess the PO attainments of 2015 admitted batch.

Venue: EEE Seminar Hall

PAC Coordinator  6/19



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

Approved by AICTE, NBA Accredited, ISO 9001:2008 Certified, Affiliated to JNTUK  
L.B.REDDY NAGAR, MYLAVARAM-521 230, KRISHNA Dist. A.P

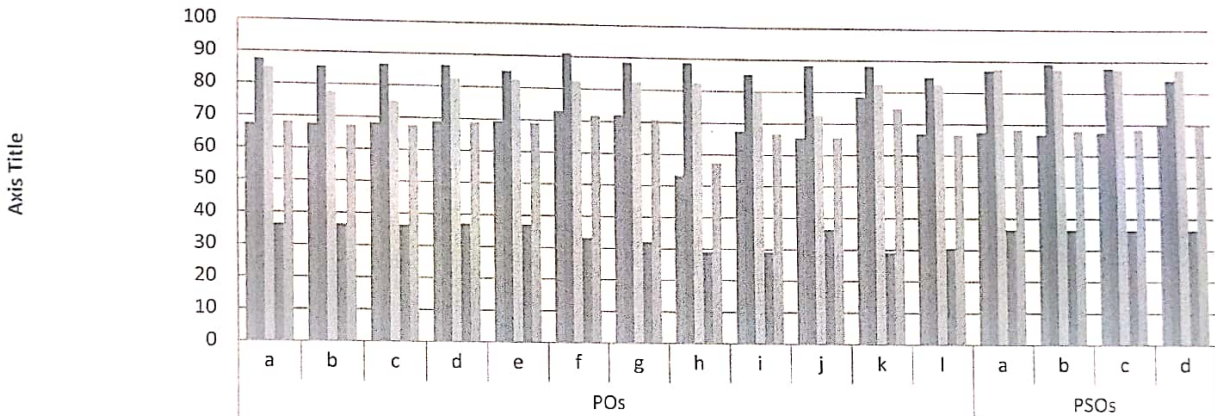
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Phone: 08659-222933 / extn:203

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**Batch: 2015-19**

**2015-19 BATCH**



Coordinator

DEPARTMENT OF EEEContinuous Improvement for A.Y 2018-19**7.1 Actions taken based on the results of evaluation of each of the COs, POs & PSOs:****POs Attainment Levels and Actions for improvement – for the A.Y.2018-19 (i.e., 2015-2019 Batch).**

POs	Target Level	Attainment Level	Observations
<b>PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.</b>			
PO1	75	68.10	<ol style="list-style-type: none"> <li>1. Out of 68 courses 95.5% courses are mapped to the PO1. 47 courses attained above the target.</li> <li>2. Course attainments of majority of courses (Basic Engineering Mechanics, computer programming, data structures, electrical machines-I, Electro Magnetic Fields, Basic Electronic Devices &amp; Circuits, Elements of Signal Processing, Thermal &amp; Prime Movers, Microprocessors &amp; Microcontrollers Basic Simulation Lab, Control Systems Lab,...etc) are less than the target values. These CO attainments which are mapped to PO1 are contributing to the direct attainment values of PO1.</li> <li>3. Student portfolio attainment (Extra-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PO1 is low.</li> </ol>
<p><b>Action 1:</b> In the courses related to programming languages, practical orientation is emphasized and a new lab course is introduced to improve the coding skills (Numerical Methods Lab) which in-turn enhances the employability opportunities.</p> <p><b>Action 2:</b> To make students acquire additional skills needed for employment.</p> <p><b>Action 3:</b> : Mandatory courses like problem assisted learning (PAL) and problem based learning (PBL) were added in the R17 regulation based on the feedback given by students in the academic year 2016-17.</p> <p><b>Action 4:</b> Five-Day Skill Development Training Program on "Industrial Automation using SCADA and IOT" from 11-02-19 To 15-02-19 is conducted.</p>			
<b>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.</b>			
PO2	75	67.25	<ol style="list-style-type: none"> <li>1. Out of 68 courses 91.2% courses are mapped to the PO2. 20 courses attained above the target value.</li> <li>2. Course attainments of majority of courses (Database management systems, Robotics and automation, HVDC Transmission, Power system Lab, Basic electronics Lab, microprocessor and microcontroller lab, Thermal and Hydro Prime movers, Engineering chemistry, computer programming, electrical power quality, solid state drives...etc) are less than the target values. Their CO attainments which are mapped to PO2 are contributing to the direct attainment values of PO2.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PO2 is low.</li> </ol>
<p><b>Action 1:</b> Additional classes are being planned to introduce the fundamental concepts of engineering courses (Basic engineering mechanics, Electrical circuit-I &amp; II, Electrical Machines-I &amp; II, Electromagnetic Fields).</p> <p><b>Action 2:</b> In program related courses to give better understanding of concepts, analysis using simulation tools,</p> <p><b>Action 3:</b> Five Day Training Program on "ANSYS Software and its Applications to Electrical Engineering" is conducted during 18-12-17 To 22-12-17.</p>			

**Action 4:** To make students acquire additional skills needed for employment, a Two day workshop on "Smart Grid Automation with Solar and Wifi Communication" is conducted during 06-09-17 To 07-09-17.

**Action 5:** Mandatory courses like problem assisted learning (PAL) and problem based learning (PBL) were added in the R17 regulation based on the feedback given by students in the academic year 2016-17.

**Action 6:** Advised to conduct seminar related to "Complex engineering problems"

**Action 7:** In house / Industrial training is organised for II & III year students in summer break.

**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	75	67.51	<ol style="list-style-type: none"> <li>1. Out of 68 courses 69% courses are mapped to the PO3. 44 courses attained above the target.</li> <li>2. Course attainment of few engineering sciences and core courses pertaining to design and development of engineering processes ( Engineering Chemistry, Electric and magnetic fields, Control Systems, Advanced Electrical Machines, Solid state drives, Elements of signal processing, Power system protection, Optimization techniques in engineering, Power electronics, Digital electronics circuits, Power system analysis, Electrical power quality, Basic Electronics Lab, Analog electronics Lab,...etc) are low.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PO3 is low.</li> </ol>
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**Action 1:** The employability enhancement skills related courses were added in the R17 regulation to increase the chance of getting employability based on the feedback given by the parents in the academic years 2014-15 & 2015-16 and feedback by students in the academic year 2016-17.

**Action 2:** Two-Day National level Workshop on "Internet of Things" had been conducted during 05-08-16 to 06-08-16, for students to carryout prototype projects for addressing the real time problems.

**Action 3:** Some of the advanced equipments like DSO 50MHZ (Digital oscilloscope) in Electrical Machines Lab, Solar Power Lab (Nevis 6005) in GETC Lab, firebird V Robot and Spark V Robot in e-Yantra are utilized to strengthen the design abilities of students.

**Action 4:** Guest Lecturer on "FACTS Devices "on 19-09-2019.

**Action 5:** Proposed to conduct Guest Lecturer on "Optimisation Techniques" in A.Y.2019-20.

**Action 6:** Advised to provide design related concepts in various courses for the coming regulations.

**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	75	68.86	<ol style="list-style-type: none"> <li>1. Out of 68 courses 44% courses are mapped to the PO4. 6 courses attained above the target.</li> <li>2. Core courses (Robotics and Automation, Database management systems, Mini project) related CO attainments are low.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PO4 is low.</li> </ol>
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**Action 1:** The Integrated learning practice (ILP) courses are given weight age (credits) in the R14 curriculum to attain the higher level of learning graduate attributes.

**Action 2:** To create awareness about the research activities taking place in the area of electrical & electronics engineering, advanced labs (GETC, e-Yantra Embedded systems & Robotics Lab) are setup.

**Action 3:** Five Day Training Program on "Industrial Automation & SCADA" conducted during 18-12-17 to 22-12-17, to make students aware of the industry requirements.

**Action 4:** Correlate internships and major project.

**Action 5:** Curriculum labs are being updated with research equipment like Solar PV Emulator, sophisticated software tools like ANSYS, MATLAB; Lab View enable students learn content beyond the syllabus.

**Action 6:** Suggest to conduct Training Program related to "Simulation tools in Engineering Problems".

**Action 7:** In house / Industrial training is organised for during II & III year students in summer break.

**PO5: Modern tool usage:** 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.

PO5	75	69.06	<ol style="list-style-type: none"> <li>1. Out of 68 courses 43% courses are mapped to the PO5. 8 courses attained above the target.</li> <li>2. In few core courses including labs which are mapped to PO5 (Database management system, Robotics and Automation, Electrical Power Quality, Electrical Machines-I &amp; II, Electrical power quality, Power system analysis, intelligent control systems) attainment values are less than target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PO5 is low.</li> </ol>
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**Action 1:** Alumni Interaction on 5-10-2018

**Action 2:** Five -Day Training Programme on "Industrial Automation & SCADA" during 18-12-2017 to 22-12-2017.

**Action 3:** Two-Day National level Workshop on "Internet of Things" during 5-08-2016 to 06-08-2016.

**Action 4:** To give more emphasis to practical knowledge and analysis, new software tool ANSYS has been added to the existing tools in computational Lab on 31/12/2016.

**Action 5:** The Integrated learning practice (ILP) courses are given weight age (credits) in the R14 curriculum to attain the higher level of learning graduate attributes.

**Action 6:** Five Day Training Program on "ANSYS Software and its Applications to Electrical Engineering" has been conducted during 18-12-17 to 22-12-17 to give better understanding of core concepts to student's using simulation tools.

**Action 7:** Students are encouraged to take up industry-based projects using emerging technologies like An IOT base smart solar PV Remote monitoring, Designing hardware implementation using CC3D and FS-16 transmitter and receiver, Advanced car parking system Audio – 2017-18

**Action 8:** Students are encouraged to participate in technical fests in and outside the campus.

**Action 9:** Certification Program on "Programmable Logic Controllers-Fundamentals and Advanced "by APSSDC During 07-05-2018 to 12-05-2018.

**Action 10:** Three day workshop on "Embedded Systems" by APSSDC during 19-02-2018 to 21-02-2018.

**Action 11:** Three day workshop on "Python software tool" by APSSDC during 04-09-2019 to 06-09-2019.

**Action12:** Suggested to conduct Training Program related to "Simulation tools in Engineering Problems"

**Action13:** It is proposed to include "Python programme and JAVA" in the coming regulation based on Industry and alumni feedback.

**Action14:** It is proposed to include "Robotics and Automation" in the coming regulation based on Industry and alumni feedback.

**Action 15:** Course content can be taught by industrial experts is identified in the coming regulation.

**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	75	71.73	<ol style="list-style-type: none"> <li>1. Out of 68 courses 29% courses are mapped to the PO6. 10 courses attained above the target.</li> <li>2. Course attainments of few core courses which are mapped to PO6 (English-I, Engineering workshop, English-II, Engineering chemistry, PEHV, EDS, Energy Conservation &amp; Audit, Power system protection, intelligent control system, and Power system analysis....etc) and Integrated Learning Practices (Mini project) are below the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education, NSS and NCC....etc) which is an indirect assessment tool mapped to PO6 is low.</li> </ol>
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**Action 1:** Quiz Competition on "The Role of Youth for Green Society", by AEEL on 11-08-2018.

**Action 2:** Awareness programmed on "Energy Conservation during Energy Conservation week" Week during 14-12-2016 to 21-12-2016

**Action 3:** The Integrated learning practice (ILP) courses are given weight age (credits) in the R14 curriculum to attain the higher level of learning graduate attributes.

**Action 4:** Students are motivated to take up extension activities through Association of Electrical Engineers of LBRCE, NSS and NCC.

**Action 5:** A Two day workshop on "Green Energy" in Collaboration with IIT MADRAS & ARK Techno solutions, Mumbai conducted with experts from industry during 12-02-16 to 13-02-16.

**Action 6:** Provide society related problems to students for their major project.

**Action 7:** Course content can be taught by industrial experts is identified in the coming regulation.

**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	70	70.80	<ol style="list-style-type: none"> <li>1. Out of 68 courses 16% courses are mapped to the PO7. 4 courses attained above the target.</li> <li>2. It is observed that the course attainments of Engineering chemistry, Power electronics, PEHV, Distributed generation are less than the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education, NSS and NCC....etc) which is an indirect assessment tool mapped to PO7 is low.</li> </ol>
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**Action 1:** Some of the courses like Engineering materials, NANO technology, Space sciences, optimization techniques, renewable energy sources and disaster management were added as program electives in R14 regulation depending up on the feedback given by parents in the academic years 2012-13 and 2013-14.

**Action 2:** Students are encouraged to take up extension activities on swatch Bharat, Energy conservation, digital India. A One-Day Workshop on "Energy Auditing" in collaboration with National Small Industries Corporation Limited 21-07-15 conducted to create awareness among the rural communities.

**Action 3:** Guest Lecture on "Renewable Energy Systems" by AEEL on 03-02-2018.

**Action 4:** Advised to conduct awareness Program related to "Environment and Sustainability".

**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO8	70	57.35	<ol style="list-style-type: none"> <li>1. Out of 68 courses 16.6% courses are mapped to the PO8. 9 courses attained above the target.</li> <li>2. Course attainments of Mini project, Internship is low.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education, NSS and NCC, and Extracurricular activities) which is an indirect assessment tool mapped to PO8 is low.</li> </ol>
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**Action 1:** Awareness is created among students to practice ethics while writing reports (Seminars, Mini and Main project, Internships, Technical publications).

**Action 2:** Mentoring system helps students to achieve professional fulfilment and assessment of student's academic progress as well as personal growth and discipline.

**Action 3:** Arranged the expert talk on "Plastic Pollution" by IEEE student branch on 18-07-2018.

**Action 4:** Guest Lecture on "Traffic Injury Prevention" by IEEE Student Branch on 22-02-2018.

**Action 5:** Advised to conduct Guest Lecture related to "Ethics and Moral Values".

**Action 6:** Advised to conduct seminar related to "Professional ethics and responsibilities".

**Action 7:** Advised to conduct more extracurricular activities in A.Y:2019-20.

**PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO9	70	66.62	<ol style="list-style-type: none"> <li>1. Out of 68 courses 31% courses are mapped to the PO9. 9 courses attained above the target.</li> <li>2. CO attainments of few courses and labs (Mini project, Internship, MPMC Lab, Seminar, PEHV) are observed to be less than the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education, NSS and NCC, and Extracurricular activities) which is an indirect assessment tool mapped to PO9 is low.</li> </ol>
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**Action 1:** The Integrated learning practice (ILP) courses are given weight age (credits) in the R14 curriculum to attain the higher level of learning graduate attributes.

- Action 2:** Students are encouraged to register for online courses offered by NPTEL.
- Action 3:** Students are motivated to participate in co-curricular and extra-curricular activities. State level Chess (Inter College Tournament), Ch Maratha of IV YEAR EEE stood First Place, Aditya Engg. College.
- Action 4:** Guest Lecture on Consensus Based Methods Applied To Economic Load Dispatch conducted by association of electrical engineers on 10-01-18 for IVB.Tech students.
- Action 5:** Industrial visit organized on 26-27 August 2019 for II B.Tech students at VTPS
- Action 6:** Industrial visit organized on 27-28 August 2019 for III B.Tech Students at LANCO
- Action 7:** Industrial visit organized on 11-12 September 2019 for IV B.Tech Students at Kumar Pumps and Motors.
- Action 8:** NSS activities conducted.
- Action 9:** Advised to conduct Industrial Training Programme in A.Y:2019-20

**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	70	65.57	<ol style="list-style-type: none"> <li>1. Out of 68 courses 27.9% courses are mapped to the PO10. 6 courses attained above the target.</li> <li>2. CO attainments of lab courses (Basic electronics lab, Electrical Machines-II lab, Data Structures lab, C-Programming lab, MPMC lab, Power system lab,...etc) and English-I are below the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PO10 is low.</li> </ol>
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**Action 1:** Communication and Presentation skills lab was added in the R14 regulation based up on the feedback given by parents.

**Action 2:** Students are motivated to participate in co-curricular and extracurricular activities within and outside the college.

**Action 3:** List the courses which are assigned based on review/presentation like, PAL, PBL, Main project, Internship.

**Action 4:** As part of Career guidance training classes A Seminar on Awareness program on "Placement Linked skill development courses" by IEEE student branch on 12-10-2018.

**Action 5:** Training on foreign language conducted.

**Action 6:** Advised to conduct Seminar related to "Effective Communication" in A.Y:2019-20.

**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	70	74.89	<ol style="list-style-type: none"> <li>1. Out of 68 courses 15% courses are mapped to the PO11. 6 courses attained above the target.</li> <li>2. The course attainments of Power system operation and control, Power system analysis, Optimization techniques in Engineering and main project are below the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education, NSS and NCC, and Extracurricular activities) which is an indirect assessment tool mapped to PO11 is low.</li> </ol>
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**Action 1:** Two-Day National Level Workshop on "3D Printing & Rapid Prototyping" on 15<sup>th</sup> -16<sup>th</sup> FEB 2017 conducted by LBRCE-IEEE Students branch where students are involved to plan and execute the events so as to acquire managerial and leadership abilities.

**Action 2:** Faculties act as facilitators in carrying out project works by the students, by updating their knowledge by attending/conducting Five Day FDP on "ANSYS for Electrical Engineering Applications" on 06-11-17 to 10-11-17 at LBRCE.

**Action 3:** Two-day workshop on "Entrepreneurship Orientation Programmed" conducted during 27-06-16 to 28-06-17 for A.Y 2016-17 to get aware about the project management and finance involved.

**Action 4:** Awareness Program on "Placement linked skill development courses" by IEEE Student Branch on 12-10-2018.

**Action 5:** Guest Lecturer on "FACTS Devices "on 19-09-2019.

**Action 6:** Advised to conduct Guest Lecturer related to " Management Skills in Engineering" for A.Y:2019-20

**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.

<b>PO12</b>	70	66.58	<ol style="list-style-type: none"><li>1. Out of 68 courses 85% courses are mapped to the PO12. 23 courses attained above the target.</li><li>2. For majority of core and lab courses (Electrical circuits-1, Measurements &amp; Instrumentation, EMF, BEDC, PEHV, CS,PGU,LDICA,EPT,CO,EDS,PSA,MPMC,DG,Basic simulation lab, Basic electronics lab, Electrical circuits &amp; measurements lab, Power system lab...etc), ILP courses (major project, Mini project, Comprehensive Viva-voce, Seminar,...etc) the attainment values are below the target values.</li><li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education, NSS and NCC, and Extracurricular activities) which is an indirect assessment tool mapped to PO12 is low.</li></ol>
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**Action 1:** Guest Lecture on "Advanced Power Electronics Converters and Drives" by AEEL on 20-03-2017.

**Action 2:** Guest Lecture on "Phase Measurements Units" conducted on 03-02-2017.

**Action 3:** A Guest Lecture on "Cloud Computing Opportunities in Power Systems" conducted by Dept. of EEE at LBRCE on 09-Sep-2016.

**Action 4:** Guest Lecture on "Influence of Hybrid Energy Storage Systems on Future Micro grids" on 27-07-2016.

**Action 5:** Guest Lecture on "EHT/HT Grid Distribution System" on 22-02-2016.

**Action 6:** Guest Lecture on "Smart Grid/ Micro Grid Technologies and Current Trends in the Industry" on 28-12-2015.

**Action 7:** Guest Lecture on "Generator Excitation Systems and Digital Voltage Regulators" on 07-09-2015.

**Action 8:** Guest Lecture on "Industrial Automation using Field Instruments, PLC and SCADA" on 29-07-2015,

**Action 9:** Two-Day national level workshop on "Smart Grid Automation with Solar and Wi-Fi Communication" during 06-09-2017 to 07-09-2017.

**Action 10:** Students are motivated to register for NPTEL courses to acquire self learning skills.

**Action 11:** Two-Day National Level Workshop on "3D Printing & Rapid Prototyping" on 15<sup>th</sup> -16<sup>th</sup> FEB 2017 conducted by LBRCE-IEEE Students branch where students are involved to plan and execute the events so as to acquire managerial and leadership abilities.

**Action 12:** IV YEAR EEE student got first and third prizes in Shot-Put And Disc-Throw, in College Annual Day Celebrations at LBRC.

**Action 13:** Guest Lecture on "Energy solutions for data centres" by AEEL, Green Energy Club & IEEE student Branch on 19-07-19.

**Action 14:** Guest Lecture on "Electricity Markets – Overview &Emerging Challenges" by IEEE Student Branch on 24-01-19.

**Action 15:** Guest Lecture on "Traffic Injury Prevention" by IEEE Student Branch on 22-02-2018.

**Action 16:** Guest Lecture on "Renewable Energy Systems "by AEEL on 03-02-2018.

**Action 17:** Guest Lecture on "Consensus Based Methods Applied To Economic Load Dispatch" by AEEL 10-01-2018.

**Action18:** Advised to conduct Guest Lecture related to "Recent Developments in Engineering" on December 2019.

**Action19:** Advised to conduct Guest Lecture related to "Engineering Tools" on February 2020.

**Action20:** Advised to conduct Guest Lecture related to "Recent Developments in Engineering" on December 2019.

**Action21:** Advised to conduct Certificate Program related to "Learning Tools in Engineering" on February 2020.

**Action22:** It is proposed to include " Python programme and JAVA" in the coming regulation based on Industry and alumni feedback.

**Action23:** It is proposed to include " Integrated practice course " in the coming regulation based on Industry and alumni feedback.



**PSO1: Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power**

PSO1	75	66.58	<ol style="list-style-type: none"> <li>1. Out of 68 courses 57% courses are mapped to the PSO1. 9 courses attained above the target.</li> <li>2. Majority of core courses (Electrical circuits-II, Electromagnetic Fields, Electrical Machines-I, Control systems, Power system protection, Power system analysis, Electrical circuits and measurements lab, Electrical machines-II lab, Power electronics lab, Power systems lab, Seminar, major project, ..Etc) attainments are less than the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PSO1 is low.</li> </ol>
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**Action 1:** To make students acquire interdisciplinary core competencies, advanced labs (e-yantra and GETC) are setup. Through these labs student's carryout mini and major project works.

**Action 2:** To make students understand core concepts in a better way, analysis of core concepts using simulation tools (like MATLAB, Lab View, ANSYS and Spice) in the courses is introduced in R17 regulation.

**Action 3:** Project guidance by visiting faculties is arranged regularly to maintain the quality of main projects.

**Action 4:** To enable students acquire the higher order learning outcomes, curricular labs are being up-graded with latest equipment, like DSO 50MHZ (Digital oscilloscope), Solar Power Lab (Nevis 6005), Hybrid Solar & Wind Energy Trainer.

**Action 5:** Co-curricular activities on emerging technologies are being conducted as per the calendar of events, like Five Day Training Program on "Industrial Automation & SCADA" conducted during 18-12-17 to 22-12-17 and Five Day Training Program on "ANSYS Software and its Applications to Electrical Engineering" are conducted during 8-12-17 to 22-12-17.

**Action 6:** Advised to conduct Workshop related to "Arduino & Node-MCU architecture" on December 2019.

**Action 7:** Advised to conduct Guest Lecture related to "Embedded C Language" on February 2020.

**PSO2: Design and analyze electrical machines, modern drive and lighting systems**

PSO2	75	63.32	<ol style="list-style-type: none"> <li>1. Out of 68 courses 51.4% courses are mapped to the PSO2. 5 courses attained above the target.</li> <li>2. Majority of core courses (Electrical Machines-II, Control systems, Power system protection, Power system analysis, Electrical power quality, Optimization techniques in engineering, Electrical circuits and measurements lab, Electrical machines-II lab, Power electronics lab, Control systems lab, Seminar, major project, ..Etc) attainments are less than the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PSO2 is low.</li> </ol>
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**Action 1:** To make students acquire interdisciplinary core competencies, advanced labs (e-yantra and GETC) are setup. Through these labs student's carryout mini and major project works.

**Action 2:** To make students understand core concepts in a better way, analysis of core concepts using simulation tools is introduced in R17 regulation.

**Action 3:** Project guidance by visiting faculties is arranged regularly to maintain the quality of main projects.

**Action 4:** To enable students acquire the higher order learning outcomes, labs are being up-graded with latest equipment, like DSO 50MHZ (Digital oscilloscope), Solar Power Lab (Nevis 6005), Hybrid Solar & Wind Energy Trainer.

**Action 5:** Co-curricular activities on emerging technologies are being conducted as per the calendar of events, like Five Day Training Program on “Industrial Automation & SCADA” conducted during 18-12-17 to 22-12-17 and Five Day Training Program on “ANSYS Software and its Applications to Electrical Engineering” are conducted during 8-12-17 to 22-12-17.

**PSO3: Specify, design, implement and test analog and embedded signal processing electronic systems**

PSO3	75	63.21	<ol style="list-style-type: none"> <li>1. Out of 68 courses 36.7% courses are mapped to the PSO3. 4 courses attained above the target.</li> <li>2. Course attainments of few electronic courses (Analog electronics, Digital electronic circuits, Power electronics, Elements of signal processing, Analog &amp; Digital electronics lab, Microprocessor and microcontrollers lab) and ILP courses (Seminar, Comprehensive viva-voce,...etc) are less than the target levels.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PSO3 is low.</li> </ol>
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**Action 1:** To make students understand core concepts in a better way, analysis of core concepts using simulation tools is introduced in R17 regulation.

**Action 2:** To improve the higher order core competencies of the students, MPMC and PE labs are up-graded.

**Action 3:** Students are motivated to use advanced labs facilities in the institute (NI, MEMS...etc) labs for carrying out their mini and main project works.

**Action 4:** Project guidance by visiting faculties is arranged regularly to maintain the quality of main projects.

**Action 5:** Co-curricular activities on emerging technologies are being conducted as per the calendar of events, like Five Day Training Program on “Industrial Automation & SCADA” conducted during 18-12-17 to 22-12-17 and Five Day Training Program on “ANSYS Software and its Applications to Electrical Engineering” are conducted during 8-12-17 to 22-12-17.

**PSO4: Design controllers for electrical and electronic systems to improve their performance**

PSO4	75	63.01	<ol style="list-style-type: none"> <li>1. Out of 68 courses 44.1% courses are mapped to the PSO4. 6 courses attained above the target.</li> <li>2. For majority of core and elective courses (Electrical machines-II, Measurements and Instrumentation, Control systems, Power electronics, Distributed Generation, Intelligent control systems, Energy conservation and Audit, Control systems lab, Electrical circuits &amp; measurements lab, power electronics lab, electrical machines-II lab, seminar, major project ....etc) attainments are less than the target values.</li> <li>3. Student portfolio attainment (Co-curricular and placement &amp; Higher education...etc) which is an indirect assessment tool mapped to PSO4 is low.</li> </ol>
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**Action 1:** To enable students acquire the higher order learning outcomes, labs are being up-graded with latest equipment, like DSO 50MHZ (Digital oscilloscope), Solar Power Lab (Nevis 6005), Hybrid Solar & Wind Energy Trainer.

**Action 2:** To make students acquire interdisciplinary core competencies, advanced labs (e-yantra and GETC) are setup. Through these labs student’s carryout mini and major project works.

**Action 3:** To make students understand core concepts in a better way, analysis of core concepts using simulation tools is introduced in R17 regulation.

**Action 4:** Project guidance by visiting faculties is arranged regularly to maintain the quality of main projects.

**Action 5:** Instrumentation core courses like Instrumentation control in paper industries, instrumentation in aerospace and navigation, system identification and adaptive control, neural networks and fuzzy logics and automotive sensors were added in the R17 regulation to enhance employability of student based on the feedback given by parents in the academic year 2014-15.

**Action 6:** Co-curricular activities on emerging technologies are being conducted as per the calendar of events.