Action Taken Report

2.6.2. Actions taken based on the results of evaluation of each of the POs and PSOs

2.6.2.1 A Documentation of POs and PSOs attainment levels

The set target levels and attainment level of POs and PSOs for 2015-2019 are given below

Sl. No	Item	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Attainment level	90.38	90.18	88.76	84.44	87.03	81.29	73.66	75.33	91.21	78.15	78.83	81.38	88.77	85.74	72.19
2	Set target level	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
3	Surplus/deficiency	10.38	10.18	8.76	4.44	7.03	1.29	-6.34	-4.67	11.21	-1.85	-1.17	1.38	8.77	5.74	-7.81

Table 2.6.2.1: Target levels and Attainment level of PO's and PSO's
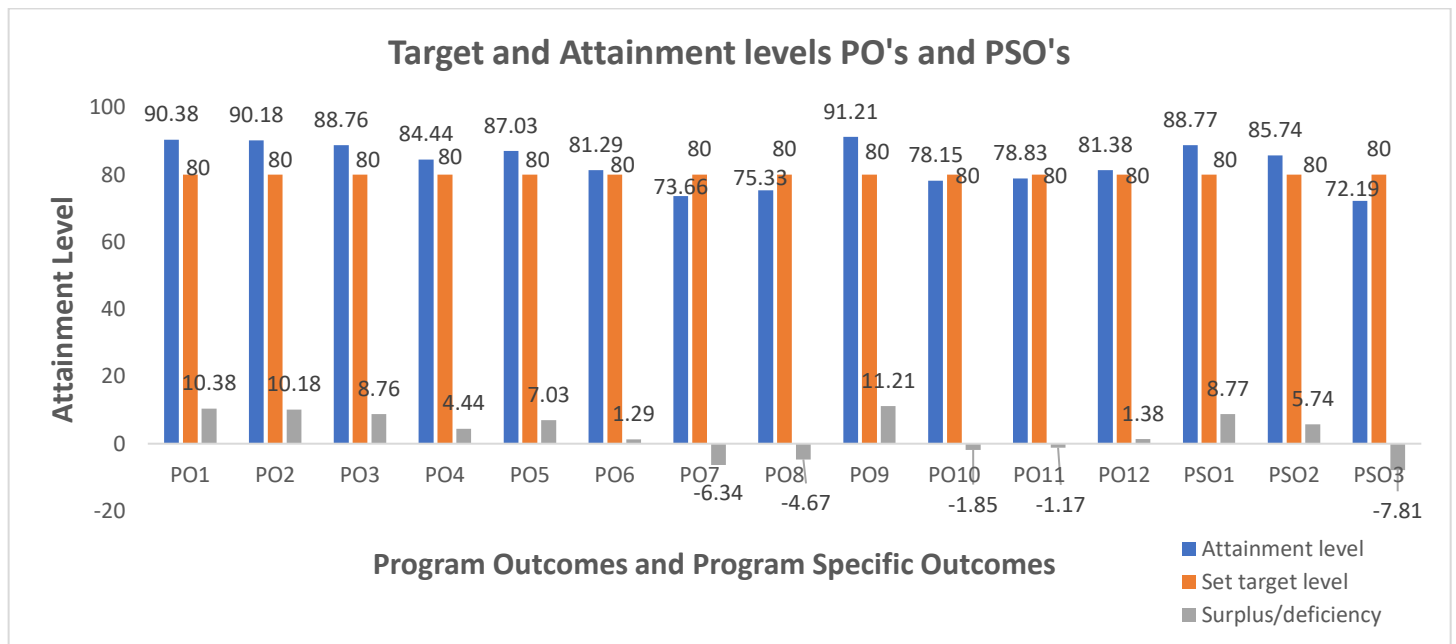

Fig. 2.6.2.1: Target levels and Attainment level of PO's and PSO's

POsAttainment Levels and Actions for improvement –2015-2019

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
1.	**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and electronics and communication engineering principles to the solution of complex problems in electronics and communication engineering.	80	90.38	10.38	Attainment level has been achieved. In order to improve further following actions has been taken.
	Action 1: Invited Talk on Gallium Nitride Devices (VLSI) by Dr.Digbijoy Nath, IISC, Banga lor e on 26/09/2016. **Action 2:**OrganizedIEEE SSIT membership drive on 14/09/2017 at NCET driven by Dr. H. K. Anasuya Devi, Professor, Department of CCE, IISc, Bengaluru.				

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
2.	**PO2: Problem analysis:** Identify, formulate, research literature, and analyse complex electronics and communication engineering problems reaching substantiated conclusions using first principles of mathematics, and engineering sciences.	80	90.18	10.18	Problem identification ability of this batch is good and improvement is achieved, To show the further improvements in other aspects the following actions are taken.
	Action 1:A Technical talk on "Embedded System and Image Processing applications" by Dr. Rathna G.N, IISC Bengaluru - 23rd September 2016 **Action 2:**Mr.Nishanth, IITBombay, has visited the college to organize –ROBOTICS Workshop in the month of July 2018. **Action 3:**General aptitude course is introduced in 5th semester to enable students to solve and analyze Numerical and data interpretation problems.				

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
3.	**PO3: Design/development of solutions:** Design/Development of Solutions: Design solutions for complex electronics and	80	88.76	8.76	Good improvement has been observed. For the students to

	communication 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.				perform better in the public related projects further actions can be taken.

Action 1: Students are encouraged to participate in STUDSAT -student satellite program which is organized by ISRO.

Action 2: Student satellite (STUD SAT-II) Team Participated in 6 Bangalore space expo 2018 7th and 8th September 2018 at BIEC (Bangalore International Exhibition Centre).

Action 3: Project based learning is introduced in 6thsemester enable students to design solutions for complex ECE problems.

Action 4:Ms. Geethanjali, Ms. YashasWini K, Mr. Chikkarangaih of STUD-SATII Participated in IEEE Project Exhibition at GSS Institute of Technology, Mysore**.**

Action 5: Conducted a 2-day technical event (TECHNOTSAVA) on project exhibition, Quiz, paper presentation and various events on 24/03/2017 and 25/03/2017.

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
4.	**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 related to electronics and communication engineering problems.	80	84.44	4.44	It was observed that attainment level is obtained. Students were able to conduct investigations on complex Engineering problems. For further improvements following actions can be taken.

Action 1: Industry visit was organized to EntupleTechnolgies, Indiranagar on 15th Feb2018.

Action 2: Organized two days workshop on "Project Based Learning" at NCET from 24/02/2018 – 25/02/2018 by Mr. DheerendraMadhusuadan, Chief Technical Officer, Pthinks solutions, Bengaluru.

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
5.	**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex electronics and communication engineering activities with an understanding of the limitations.	80	87.03	7.03	Attainment level is achieved. Students are able to use modern tools.

Action 1: MATLAB software was updated to latest version(R2018a) in April 2018.

Action 2: Virtual lab nodal facility is actively used by first year students dated 7/02/2018 to 28/02/2018.

Action 3: Creating Interactive and Responsive Web Pages (IC) course is introduced in 3rd semester to learn new technology, which is taught by industry people.

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
6.	**PO6: The engineer and society:** 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 electronics and communication engineering practice.	80	81.29	1.29	In 8th semester project work, it was seen that the project meets the specifications with consideration for public health, safety, cultural and societal issues.

Action 1: Invited talk on "Career Digest" by Mr. Balaji, ABB on 4/11/2017 at NCET.

Action 2: Industry visit was organized to EntupleTechnolgies, Indiranagar on 15th Feb'2018.

Action 3: Organized swami Vivekananda jayanthi on 12/01/2018 at NCET.

Action 4: Conducted Blood donation camp on 21/03/2018 at NCET.

Action 5: Industrial visit to Indian Institute of Astrophysics (IIAP), Gauribidanur, Karnataka on 04/05/2017.

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
7.	**PO7: Environment and sustainability:** Environment and Sustainability: Understand the impact of the professional electronics and communication engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	80	73.66	-6.34	1. In 8th semester project work it was seen that the project could meet the specifications with consideration to environmental and ethical aspects. 2. Students are aware that the technological development cannot sustain without environmental concern for sustainability.
	Action 1: Eco club is formed and carrying various activities to create awareness among the students about environment. **Action 2:** Organized a program "Ralley for Rivers" on 05/09/2017 at NCET. **Action 3:** NCET has participated in swach Bharath ranking 2017 and shortlisted for final selection in New Delhi on 14/09/2017. **Action 4:** Plant sapling during SAGY workshop on 25/11/2017 at NCET. **Action 5:** Workshop on HAM was conducted on 09/03/2017 by Mr. Satyapal, Director, Indian Institute of HAM for students to help the society to sustain the communication at the time of natural disasters using HAM Radio.				

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
8.	**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the electronics and communication engineering practice.	80	75.33	-4.67	Students need to givenaware of professional ethics.
	Action 1: Organized five day'sworkshops on "Personality development programme" by Art of Living Foundation, Bangalore on 11/09/2017 – 15/09/2017. **Action 2:** Students participated in inter-collegiate climate change quiz 2017 held at JN tata auditorium on 14th sept 2017 there by creating awareness about climatic change. **Action 3:** Students and faculties participated in World Youth Meet -2017 held at SatyaSaiGrama,Muddenahalli from 19th to 23rd November 2017. **Action 4:** Open elective courses like yoga, dance, martial arts, photography and sports are introduced in 6th semester for their personality development.				

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
9.	**PO9: Individual and team work:** Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	80	91.21	11.21	Efficiency in working in team is good Further actions can be taken for improvement.

Action 1: Photography workshop "KUSHAKSHA" organized by NCET Eagle eye captures on 20th&21st April 2017.

Action 2: Team work and leadership qualities were taught thorough NSS activities.
.

Action 3: ConductedPlacement Training classes for students by Industrial experts.

Action 4: IEEE student branch and IEEE SSIT ES chapter activities were inaugurated by Dr. ShalabhBhatnagar, Professor, Department of Computer Science & Automation, IISc, Bengaluru, on 04/10/2017at Nagarjuna College of Engineering & Technology, Bengaluru.

Action 5: Ability to work in a team and develop leadership qualities were monitored during 8th semester project work.

Action 6:8th sem ECE Students visited to IISC Bangalore on the occasion of Open Day at IISc held on 23rd march-2019**.**

Sl. No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
10.	**PO10: Communication:** Communicate effectively on complex electronics and communication 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.	80	78.15	-1.85	In Technical seminars and project presentations student's communication skills need improvement For improvements, following actions has been taken.

Action 1: Soft skill training is imparted to students to enhance various aspects communication/ technical talks by group discussion.

Action 2: Toast masters club is formed where students will be acquiring the leadership and communication skills by actively participating in various events.

Action 3: Mr. Chikkaringaiah T R, Department of ECE received 1st place in "Poster

Presentation andEssay competition" organized by NSS, YRC and Red Ribbon Club on 9th Jan 2018 on the eve of World's Youth Day.

Action 4: Occasionally class room presentations in regular class topics were organized.

Action 5: Technical Aptitude and GD courses are introduced in 6th semester to increase their problem solving analysis and communication skills.

Sl. No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
11.	**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.	80	78.83	-1.17	Attainment is not achieved. Project management skills can be improved by the following actions.
	Action 1: Organized "Start Up India Competition" for all branch students at NCET on 19/04/2017. **Action 2**: Students attended Industrial internship at various central Govt. organizations like BEL and BSNL and so on. **Action 3**:Meghana A S and Team had submitted final year student project to Karnataka State Council for Science and Technology (KSCST), Govt. of Karnataka entitled "Intelligence WSN Interceptor for Vehicles" in the academic year 2018-2019 and received Grant of Rs 6000/-				

Sl. No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
12.	**PO12: Life-long learning:** 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.	80	81.38	1.38	Students showed keen interest in improving their skills in achieving career development.
	Action 1: Interactive session on "opportunities of internship at Foreign Universities" by Mrs. AparnaBairagi on 22/04/2017. **Action 2:** Invited talk on "Career Digest" by Mr. Balaji, ABB on 4/11/2017 at NCET.				

Table 2.6.2.2: POs Attainment Levels and Actions for improvement

PSOs Attainment Levels and Actions for improvement – 2015-2019

Sl. No	Program Specific Objectives	Target	Attainment	Surplus / Deficiency	Observation
1.	**PSO1:** Graduate will be able to identify, analyze& solve the problems related to Electronics and Communication Engineering by applying the fundamental knowledge of Electronics and Communication.	80	88.77	8.77	The courses of the program are demonstrating theirsource fullness for Contemporary issues. The project titles of the final year year students are addressing the real-life problems.
	Action 1: Industry visit was organized to EntupleTechnolgies, Indiranagar on 15th Feb'2018. **Action 2:** A Technical talk on "Embedded System and Image Processing applications" by Dr. Rathna G.N, IISC Bengaluru - 23rd September 2016 **Action 3:** Mr.Nishanth, IITBombay, has visited the college to organize –ROBOTICS Workshop in the month of July 2018. **Action 4:** General aptitude course is introduced in 5th semester to enable students to sole and analyze Numerical and data interpretation problems.					

Sl. No	Program Specific Objectives	Target	Attainment	Surplus/ Deficiency	Observation
2.	**PSO2:** Graduate will demonstrate an ability to investigate, design and develop both software and hardware using significant knowledge of modern tools in Electronics and Communication Engineering.	80	85.74	5.74	An improvement is seen in the learnability of students in programming subjects so that they can design and develop projects.
	Action 1: Students were advised to take up online NPTEL courses on basic engineering hardware and programming languages. **Action 2:** IEEE SSIT membership drive on 14/09/2017 at NCET driven by Dr. H. K. Anasuya Devi, Professor, Department of CCE, IISc, Bengaluru. **Action 3**: Organized two days workshop on "Project Based Learning" at NCET from 24/02/2018 – 25/02/2018 by Mr. DheerendraMadhusuadan, Chief Technical Officer, Pthinks solutions, Bengaluru.					

Sl. No	Program Specific Objectives	Target	Attainment	Surplus/Deficiency	Observation
3.	**PSO3:** Graduate will be able to apply their knowledge to assess societal, environmental, health, safety issues with professional ethics and can also pursue higher studies, involve in research activities, be employable or entrepreneur.	80	72.19	-7.81	It was observed that students not able to address the issues like health and safety and encouraged to pursue their higher studies.
	Action 1:NCET has participated in swachbharath ranking 2017 and shortlisted for final selection in New Delhi on 14/09/2017. **Action 2:**Plant sapling during SAGY workshop on 25/11/2017 at NCET. **Action 3:**Chikkarangaiah T.R. YashaswiniKundapur, Sai M Geethanjali Design and Implementation of Backup On-Board Computer for STUDSAT-2 IEEE Conference- 2019 4th International Conference on Recent Trends on Electronics, Information, Communication & Technology (RTEICT2019) Sri Venkateshwara College of Engineeri ng Bengaluru MAY 17th & 18th 2019**.** **Action 4:** Workshop on HAM was conducted on 09/03/2017 by Mr. Satyapal, Director, Indian Institute of HAM for students to help the society to sustain the communication at the time of natural disasters using HAM Radio.					

Table 2.6.2.3: POS's Attainment Levels and Actions for improvement

The set target levels and attainment level of POs and for 2016-2020 are given below

Sl. No	Item	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Attainment level	87.34	88.09	87.18	80.37	84.45	79.01	76.36	71.52	87.04	83.72	80.76	79.32	87.50	83.43	70.72
2	Set target level	80	80	80	80	80	75	75	70	80	80	80	75	85	80	70
3	Surplus/deficiency	7.34	8.09	7.18	0.37	4.45	4.01	1.36	1.52	7.04	3.72	0.76	4.32	2.50	3.43	0.72

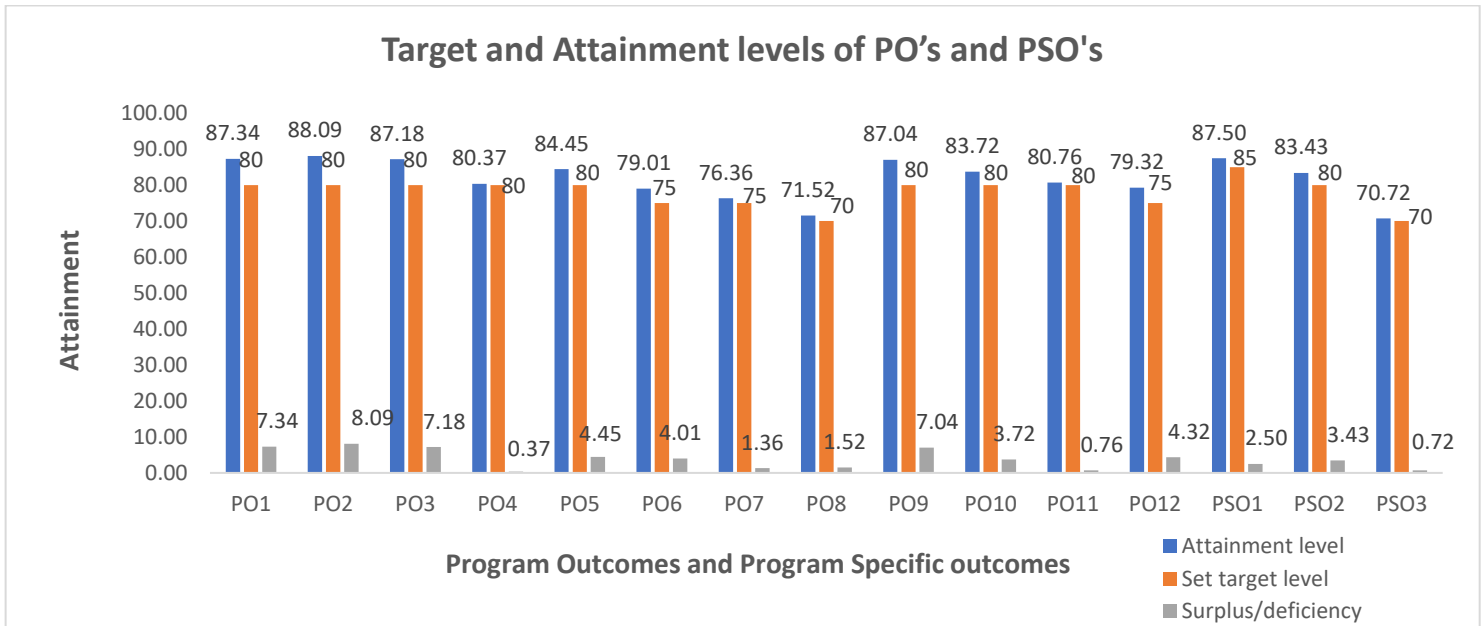**Table 2.6.2.4: Target levels and Attainment level of PO's and PSO's**

Fig. 2.6.2.2: Target levels and Attainment level of PO's and PSO's

POs Attainment Levels and Actions for improvement – 2016-2020

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
1.	**PO1: Engineeringknowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and electronics and communication engineering principles to the solution of complex problems in electronics and communication engineering	80	87.34	7.34	Attainment level has been achieved. In order to improve further following actions has been taken.
	Action 1: Mr.Nishanth, IITBombay, has visited the college to organize –ROBOTICS Workshop in the month of July 2018 for students of NCET. **Action 2:**OrganizedIEEE SSIT membership drive on 14/09/2017 at NCET driven by Dr. H. K. Anasuya Devi, Professor, Department of CCE, IISc, Bengaluru.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
2.	**PO2: Problem analysis:** Identify, formulate, research literature, and analyse complex electronics and communication engineering problems reaching substantiated conclusions using first principles of mathematics,	80	88.09	8.09	Problem identification ability of the current batch is good and improvement is achieved, to show the further improvements in other aspects the following

					actions are taken.
	and engineering sciences.				

Action 1: Technical Quiz on Electronics to build analytical skills among the students on 24/03/2017 and 25/03/2017.

Action 2: The 3 Days Hands on Workshop on "Internet of Things And Home Automation" for 5th semester EC students was held from 4 October 2018 to 6 October 2018.

Action 3: General aptitude course is introduced in 5th semester to enable students to solve and analyze Numerical and data interpretation problems.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
3.	**PO3: Design/development of solutions:** Design/Development of Solutions: Design solutions for complex electronics and communication 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.	80	87.18	7.18	Satisfactory and positive motivation has been observed, to improve the students to perform better in the public related projects are given to the students.
	Action 1: Creating Interactive and Responsive Web Pages (IC) course is introduced in 3rd semester to learn new technology, which is taught by industry people. **Action 2:**organized a one-day industrial visit to" Core EL Technologies" Bengaluru on 29/08/2018 for 5th semester ECE students. **Action 3:**STUDSAT students visited Satish Dhawn space center SHAR ISRO, Sriharikota launch station on the occasion of National Workshop on Challenges and Modern Techniques realizing complex the infrastructure on 5th march 2018.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
4.	**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 related to electronics and communication engineering problems.	80	80.37	0.37	The complex problem-solving analysis to the batch has been improved; to help the students to improve analysis interpretation, following actions has been taken.

	Action 1:ECE Department in association with CSE Department has organized FOUR Days Hands on Workshop on IOT from 16th to 19th September 2019. **Action 2:**Organized an industrial visit to IIAP, Gowribidanuron 4th May 2017 to understand the practical application of Antennas, analyze and interpret the data received.				

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
5.	**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex electronics and communication engineering activities with an understanding of the limitations.	80	84.45	4.45	Target is attained. To educate the pupil further, the proposed action has been initiated.
	Action 1: Industrial visit to Entuple Technologies, Bengaluru on 15-02-2018 Organized by Department of Electronics and Communication for 4th semester ECE students. **Action 2:** Virtual labs was introduced to students for the theacedamic 2016-2017 year on May 12th 2017, our college is recognized as one of the active nodal center of value virtual labs, an initiative of MHRD under NME-ICT. **Action 3:**The 3 Days Hands on Workshop on "Internet of Things and Home Automation" for 5th semester EC students was held from 4 October 2018 to 6 October 2018.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
6.	**PO6: The engineer and society:** 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 electronics and communication engineering practice.	75	79.01	4.01	Good improvements have been obtained, to update the students for the current trends in the fields of science and engineering further actions has been taken.
	Action 1: Introduced integrated rural development -Part1 course in 3rd semester to make students understand the responsibility towards society. **Action 2:**Organized industrial visit to" Indian Institute of Astrophysics" Gowribidanuruon 12/09/2018 for fifth semester EC students.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
7.	**PO7: Environment and sustainability:** Environment and Sustainability: Understand the impact of the professional electronics and communication engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	75	76.36	1.36	Improvements are obtained; to achieve and improve it further the following actions are adopted.

Action 1: Inauguration of Eco club is formed to create awareness among the students about environment on 22/09/2016.

Action 2: Conducted World Environment Day in college and organized several activities to create awareness among the students and staff about the environment issues on 05/06/2017.

Action 3: Guest Lectureon HAM was conducted on 09/03/2017by Mr. Satyapal, Director, Indian Institute of HAM for students to help the society to sustain the communication at the time of natural disasters using HAM Radio.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
8.	**PO8:Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the electronics and communication engineering practice.	70	71.52	1.52	Awareness levels of the students on engineering ethics are improved. .

Action 1: Conducted 6 days workshop on "Youth Empowerment and skills" from 19/09/2016 - 24/09/2016 by Art of Living team.

Action 2: A Session on "How to prepare for exams" by SYMPHONIC ETHICS FOUNDATION at NCET on 27/10/2016.

Action 3: Open elective courses like yoga, dance, martial arts, photography and sports are introduced in 6th semester for their personality development.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
9.	**PO9: Individual and team work:** Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	80	87.04	7.04	Improvements in the students team work have been observed.

Action 1:IIT Bombay organized Techfest Mesmerize competition at UVCE Bangalore on 1 October 2018 Mr. P.Maharshi Naveen -1NC16EC058 and Team Participated in the competition.

Action 2: Conducted Placement Training classes for students by Industrial experts.

Action 3: Ability to work in a team and develop leadership qualities were monitored during 8th semester project work.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
10.	**PO10:Communication:** Communicate effectively on complex electronics and communication 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.	80	83.72	3.72	As per observation, it is noted that there is an improvement in the attainment. For the further improvements following actions can be followed.

Action 1: To conduct various Communication skill development programs to improve interpersonal skills.

Action 2: Inauguration of Communication Club on 04-04-2017 at NCET. Here Soft skills training is imparted to students to enhance various aspects of communication/technical talks by group discussions, presentations and new learning outcomes.

Action 3: Technical Aptitude and GD courses are introduced in 6th semester to increase their problem solving analysis and communication skills.

Action 4: Toast masters club is formed where students will be acquiring the leadership and communication skills by actively participating in various events.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
11.	**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.	80	80.76	0.76	Changes are observed in the attainments. For further improvement in project management skills following action is taken.

Action 1: Students attended Industrial internship at various central Govt. organizations like BEL and BSNL and so on.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
12.	**PO12: Life-long learning:** 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.	75	79.32	4.32	Significant achievement is obtained. To improve the lifelong learning for the better productivity of the student following actions are taken.
	Action plan 1:A team of experts from Art of living can be invited to teach professional ethics highlighting the importance of honesty, integrity and reliability in engineering. **Action Plan2:** Training classes at regular intervals in aptitude and soft kills were arrangedto improve the learning ability and to induce self learning capability.				

Table 2.6.2.5:PO's Attainment Levels and Actions for improvement

PSOs Attainment Levels and Actions for improvement –2016-2020

Sl.No	Program Specific Objectives	Target	Attainment	Surplus/ Deficiency	Observation
1.	**PSO1:** Graduate will be able to identify, analyze& solve the problems related to Electronics and Communication Engineering by applying the fundamental knowledge of Electronics and Communication.	85	87.50	2.50	It is observed that most of the students are good at fundamentals of problem-solving skills. To improve attainment further following measures are initiated.
	Action Plan 1: Students are motivated to take up the real life problems during their project work so that they can design, analyze and find solution which gives exposure to latest Technologies.				

Sl.No	Program Specific Objectives	Target	Attainment	Surplus/ Deficiency	Observation
2.	**PSO2:** Graduate will demonstrate an ability to investigate, design and develop both software and hardware using significant knowledge of modern tools in Electronics and Communication Engineering.	80	83.43	3.43	Significant improvement has been observed with available modern tools.
	Action Plan 1: Academicworkshops and conferences can be conducted to apply more knowledge in terms of conduction of experiments and analysis. **Action Plan 2:** Students are motivated to take up projects under the sponsorship of KSCST.				

Sl.No	Program Specific Objectives	Target	Attainment	Surplus/ Deficiency	Observation
3.	**PSO3:** Graduate will be able to apply their knowledge to assess societal, environmental, health, safety issues with professional ethics and can also pursue higher studies, involve in research activities, be employable or entrepreneur.	70	70.72	0.72	Improvement is observed in the knowledge gained by the student by imparting environmentally friendly projects.
	Action Plan 1: Career readiness program and corporate lectures are to be arranged to meet required expertise in field of engineering. **Action Plan 2:** Motivating the students for independent learning & to implement it in day to day life through technical upgradation.				

Table 2.6.2.6: PSO's Attainment Levels and Actions for improvement

The set target levels and attainment level of POs for 2017-2021 are given below

Sl. No	Item	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Attainment level	84.03	84.47	84.28	79.6	81.83	77.84	70.92	79.51	84.33	80.33	79.11	75.65	84.5	79.98	66.83
2	Set target level	80	80	80	75	80	75	70	75	80	80	75	75	80	75	65
3	Surplus/deficiency	4.03	4.47	4.28	4.60	1.83	2.84	0.92	4.51	4.33	0.33	4.11	0.65	4.50	4.98	1.83

Table 2.6.2.7: Target levels and Attainment level of PO's
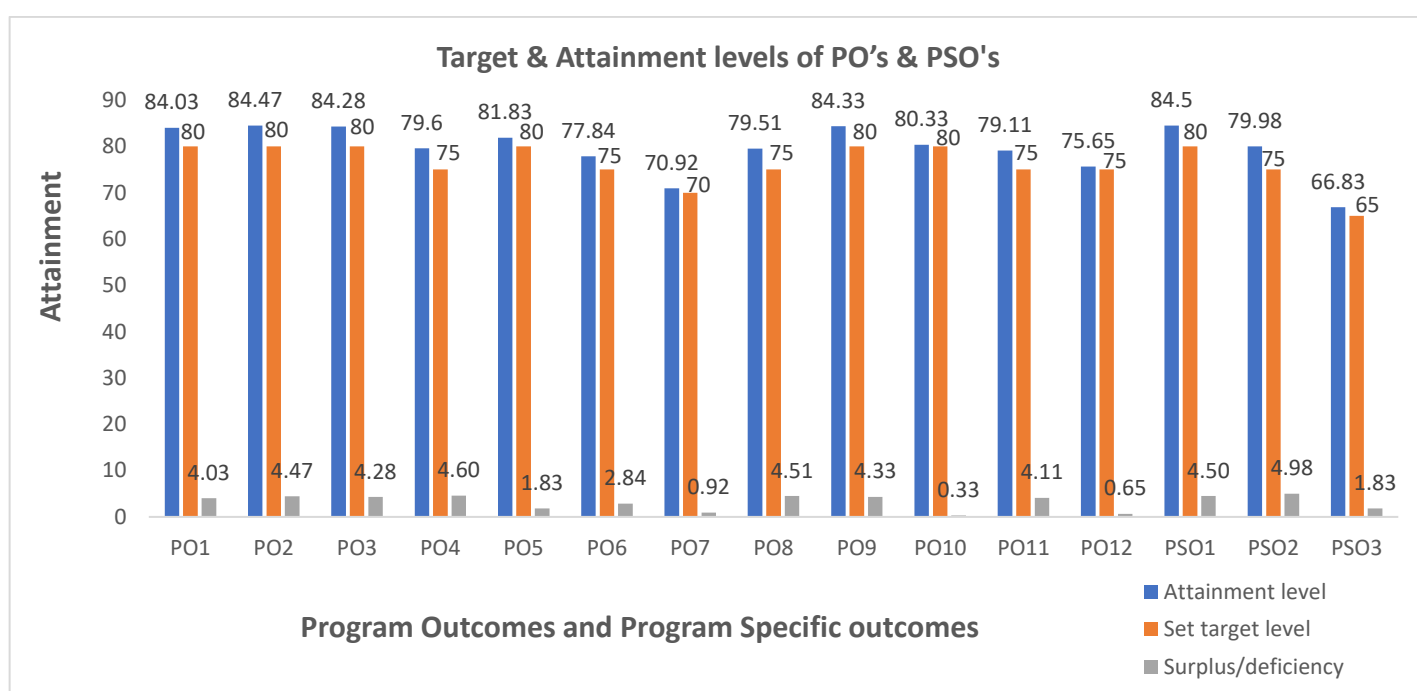

Fig. 2.6.2.3: Target levels and Attainment level of PO's and PSO's

POs Attainment Levels and Actions for improvement for the year 2017-2021

Sl.No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
1.	**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and electronics and communication engineering principles to the solution of complex problems in electronics and communication engineering.	80	84.03	4.03	Attainment is achieved and for further improvements the following actions can be taken.

Action plan 1: We inspire students to participate and organize technical events where their knowledge should convert to application matching with defined level of their standards. **Action plan2:**Project based learning classes are conducted to enhance the practical working.	

Sl.No	Program Outcomes	Target	Attainment	Surplus/ Deficiency	Observation
2.	**PO2: Problem analysis:** Identify, formulate, research literature, and analyse complex electronics and communication engineering problems reaching substantiated conclusions using first principles of mathematics, and engineering sciences.	80	84.47	4.47	It was seen that students were motivated to take up projects sponsored by MHRD and nationwide student competitions.
	Action 1: Organized Three Day hands on workshop on Robotic application using TI Microcontroller under Robotic club from 16th to 18th September 2019. **Action 2:**Ms. Roopa S R, and Ms. Harshitha C, from 3rd semester ECE achieved First Place in WEBENCH, Drishti Online Contest an online contest held on 28 August 2018 by TI University Program**.** **Action 3:**General Aptitude course is introduced in 5th semester to solve and analyze Numerical and data interpretation problems.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
3.	**PO3: Design/development of solutions:** Design/Development of Solutions: Design solutions for complex electronics and communication 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.	80	84.28	4.28	Students were motivated to take up real time projects.
	Action 1:students encouraged to take up summer internship programs. **Action 2:**Robotic Application using TI Microcontroller from 16.9.2019 to 18.9.2019 under the banner of Robotic Club. **Action 3**: Students were advised to take up online NPTEL courses on basic engineering hardware and programming languages. **Action 4:**Project base learning course is introduced in 6th semester todevelop engineering solutions to complex problems through systematic approach.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
4.	**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 related to electronics and communication engineering problems.	75	79.6	4.60	After studying programming subject'spractical knowledge in programming skills will improve.However, to further enhance their knowledge following actions are planned
	Action 1:organized a Industrial Visit to " HAL Heritage Centre", Bengaluru on 21/08/2018 for Third semester ECE students. **Action 2:**Electronics Club Under the guidance of Dr. Wilfred John Vaz, Department of Electronics and Communication introduced Electronics Club for 3rd and 5th semester students to do their AAT(projects).					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
5.	**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex electronics and communication engineering activities with an understanding of the limitations.	80	81.83	1.83	Attainment is achieved and for further improvements the following actions taken.
	Action 1:organized Technical talk on "Internet of th Things (IOT)" on 6 March 2019. Mr. Manish Kumar Singh from ATSL Solutions, has shared several technical information about IOTand its usefulness in real time applications**.** **Action 2:**Guest Lecture by Dr. Kishore kumar T, Professor, ECE Department, NIT WARANGAL. Guest Lecture by Dr. Kishore Kumar T, Professor, ECE Department, NITWARANGAL, on "Recent trends in Signal Processing and its Applications"* and "Research Proposals and Funding Agencies" was arranged by ECE Department on 28.2.2020 **Action 3:**Creating Interactive and Responsive Web Pages (IC) course is introduced in 3rd semester which was taught by industry people.					

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
6.	**PO6: The engineer and society:** 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 electronics and communication engineering practice.	75	77.84	2.84	We see to that the project could meet the specifications with consideration for public health, safety, cultural and societal issues.

Action 1: Invited Talk on HAM (Amateur Radio) for the students and staff of ECE department was organized by Electronics and Communication Engineering department on 4th September 2019

Action 2:organized Alumni Talk on the topic "How to pursue your career in Electronics Domain" on 23/03/2019. Mr. Balaij M.V(2006 Batch, NCET ECE alumni) Head Embedded Systems – Hynetic Electronics Pvt Ltd delivered the talk.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
7.	**PO7: Environment and sustainability:** Environment and Sustainability: Understand the impact of the professional electronics and communication engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	70	70.92	0.92	In final semester project work it was seen that the project could meet the specifications with consideration to environmental and ethical aspects.

Action 1: Students should be motivated to carry out projects which have positive impact on society, environment and its sustainability.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
8.	**PO8: Ethics:**Apply ethical principles and commit to professional ethics and responsibilities and norms of the electronics and communication engineering practice.	75	79.51	4.51	Students showedawareness and concern for ethical values.

Action 1: Students are advisedto follow professional ethics in their professional life.

Action 2: Invited talks on ethics with emphasis on engineering profession were conducted by experts from ISCKON.

Action 3: Dr. Girish has given presentation on IRDP program organized by department of Electronics and Communication.

Action 4: Integrated Rural Development course is introduced in 3rd and 4th semester to make an impact to rural section of society, thus building their self-confidence.

Action 5: Open electives like yoga, martial arts, dance and photography courses are introduced for their personality development.

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
9.	**PO9: Individual and team work:** Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	80	84.33	4.33	Because of the sufficient exposure of students to team work related activities a surplus is achieved.
	Action 1: Students are motivated to present seminars on relevant topics assigned by the faculty with respect to the curriculum for the individual development of the student. **Action 2:** Mr.Neeraj Venkat attended workshop on blockchain held at IISC Bangalore February, 2020 **Action 3:** Mr. Neeraj Venkat attended IEEE seminar on VLSI test design on September 21st and 22nd, 2019. This was held in BMSCE				

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
10.	**PO10:Communication:** Communicate effectively on complex electronics and communication 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.	80	80.33	0.33	Communication skill of a segment of students was found to be less.
	Action plan 1: To conduct various Communication skill development programs to improve interpersonal skills. **Action plan 2:** Faculties can conduct group discussions on various topics to improve public speaking skills in students.				

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
11.	**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.	75	79.11	4.11	The skill of students in planning, analysis and execution of activities related to project management are attained.
	Action 1: It is planned to impart technical education through mini projects and hobby projects by exhibiting in technical fest. **Action 2:** Students need to develop and execute projects analyzing the requirement of the projects in terms of components availability, leadership quality and finance management.				

Sl.No	Program Outcomes	Target	Attainment	Surplus/Deficiency	Observation
12.	**PO12: Life-long learning:** 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.	75	75.65	0.65	Students showed keen interest in improving their skills in achieving carrier development.
	Action 1: A team of experts from Art of living can be invited to teach professional ethics highlighting the importance of honesty, integrity and reliability in engineering. **Action 2:** Training classes at regular intervals in aptitude and soft kills were arrangedto improve the learning ability and to induce self learning capability.				

Table 2.6.2.8: POs Attainment Levels and Actions for improvement

PSOs Attainment Levels and Actions for improvement for the year 2017-2021

Sl.No	Program Specific Objectives	Target	Attainment	Surplus/ Deficiency	Observation
1.	**PSO1:** Graduate will be able to identify, analyze& solve the problems related to Electronics and Communication Engineering by applying the fundamental knowledge of Electronics and Communication.	80	84.5	4.50	The courses of the program are demonstrating their source fullness for Contemporary issues. The project titles of the final year students are addressing the reallife problems.
	Action 1: Students are motivated to take up the real-life problems during their project work so that they can design, analyze and find solution which gives exposure to latest Technologies.				

Sl.No	Program Specific Objectives	Target	Attainment	Surplus/Deficiency	Observation
2.	**PSO2:** Graduate will demonstrate an ability to investigate, design and develop both software and hardware using significant knowledge of modern tools in Electronics and Communication Engineering.	75	79.98	4.98	Students were aware of different tools and designs to implement and test projects.
	Action 1: Academic workshops and conferences can be conducted to apply more knowledge in terms of conduction of experiments and analysis.				
	Action 2: Students are motivated to take up projects under the sponsorship of KSCST. Two Projects have been selected for KSCST funded projects.				

Sl.No	Program Specific Objectives	Target	Attainment	Surplus/Deficiency	Observation
3.	**PSO3:** Graduate will be able to apply their knowledge to assess societal, environmental, health, safety issues with professional ethics and can also pursue higher studies, involve in research activities, be employable or entrepreneur.	65	66.83	1.83	To improve further in ethics, good interpersonal relationships, ability to communicate, leadership and project management the following action

					plans can be taken.
	Action Plan 1: Career readiness program and corporate lectures are to be arranged to meet required expertise in field of engineering.				
	Action Plan 2: Motivating the students for independent learning & to implement it in day to day life through technical up gradation.				

Table 2.6.2.9: PSOs Attainment Levels and Actions for improvement