Innovation in Teaching & Learning

A. Teaching & Learning process:

Fig.1 shows the process of teaching and learning.
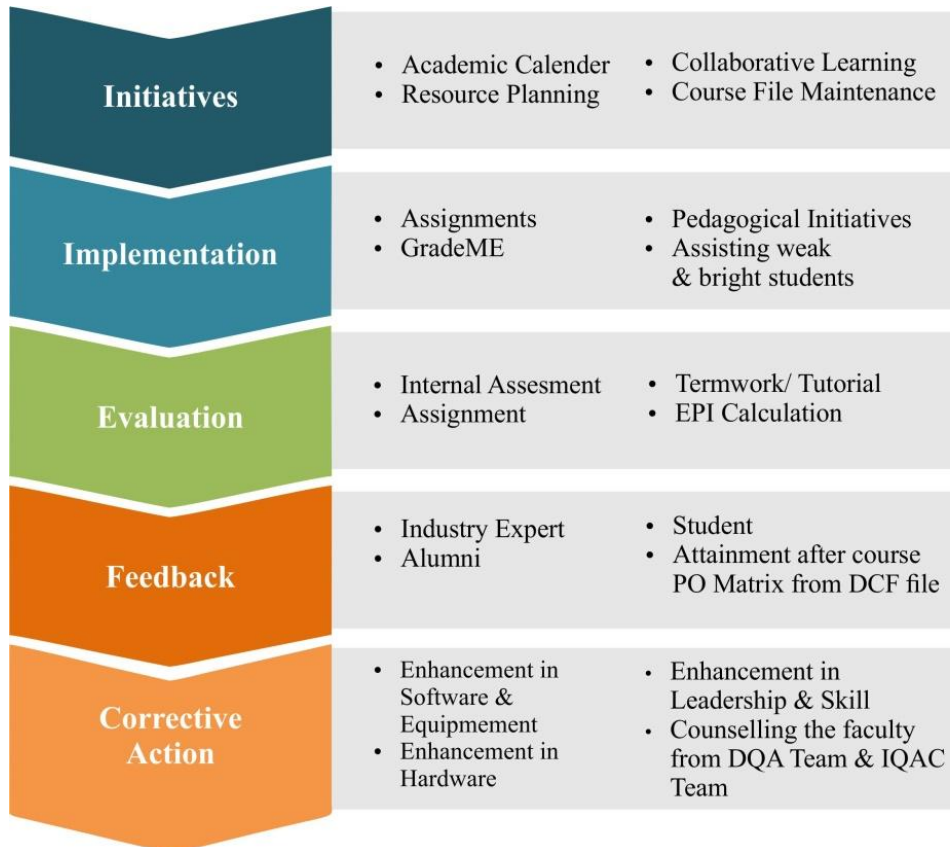

Initiatives	• Academic Calender • Resource Planning	• Collaborative Learning • Course File Maintenance
Implementation	• Assignments • GradeME	• Pedagogical Initiatives • Assisting weak & bright students
Evaluation	• Internal Assesment • Assignment	• Termwork/ Tutorial • EPI Calculation
Feedback	• Industry Expert • Alumni	• Student • Attainment after course PO Matrix from DCF file
Corrective Action	• Enhancement in Software & Equipmement • Enhancement in Hardware	• Enhancement in Leadership & Skill • Counselling the faculty from DQA Team & IQAC Team

Fig.1: Teaching and Learning Process.

1. Initiatives to improve quality of Teaching & Learning:

- **Adherence to Academic Calendar:**
  - ➢ At the start of each semester, academic calendar is prepared. HOD assigns the responsibility of each activity to the concerned faculty. HOD, with the help of DQA members, distributes the workload, after which the timetable is prepared by timetable committee in consultation with other departments.
  - ➢ The timetable is displayed on notice boards and the institute's website in advance. Class counselors are appointed for each class and contact details of students are displayed on notice board.

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Dr. D. Y. Patil Group's
RAMRAO ADIK INSTITUTE OF TECHNOLOGY, NERUL

ACADEMIC CALENDAR
July 2017-November 2017

Fig. 2: Teaching and Learning Process.

- **Resource Planning:**
  - The requirement of instruments/equipments/softwares as per the new/current syllabus is collected from faculty members and the purchase procedure is carried out.
  - Books needed for the current curriculum are procured in the department library in consultation with library coordinator.
- **Collaborative Learning:**
  - Faculty members are encouraged to attend workshops, STTPs, FDPs and Conferences and also actively participate in R&D activities.
  - Faculty members are instructed to attend orientation programs for the new CBSGS /CBCGS subjects of the prevailing Semester.
  - Planning of Industrial Training and Workshops, Experts talks for students as a part of Collaborative Learning.
- **Recruitments:**
  - At the onset of each semester the requirements of faculty members according to the new/current syllabus are considered and if required, new faculty members are recruited maintaining the required student-teacher ratio.
- **Course File Maintenance:**
  - Faculty members prepare their course files which consist of teaching plan, lecture schedule, course objectives, COs, results analysis of subjects, previous years question papers, list of reference books, continuous evaluation sheets and notes.

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Fig.3: Course file index sheet.

- **DQA Meeting:**
  - ➤ DQA members in consultation with HOD discuss various points for smooth instruction delivery.
  - ➤ DQA members from various committees at the department level for monitoring of various academic activities.

Fig.4: DQA Meeting.

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2. Implementation to improve quality of Teaching & Learning:

- **Pre-Requisite test:**
  - ➢ Faculty members conduct prerequisite test at the onset of the semester to know students concepts and knowledge required for individual course. Faculty keeps data related to prerequisite tests in the course file.

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Academic Year: 2017-18 (Odd Semester)

Prerequisite Test

Class: B.E.   Div: A   Sem : VII   Date: 21/07/2017 Duration: 45 min
Subject: IC Technology   Test ID: 14

Name of the student: _____

Roll No: _____

Maximum Marks: 20   Marks Obtained:

Note: Each question carries 1 mark.
Q 1. Which of the following circuit requires minimum number of transistor

(A) static (B) dynamic (C) domino (D) NORA

Q.2. IC fabrication is carried out in

(A) Dark room (B) Clean room (C) Contaminated room (D) None of the above

Q.3.The software used for IC fabrication is
(A) TCAD (B) Cadence (C) Electric (D) None of the above

Q.4 Base of VLSI is
(A) Moore's law (B) Diffusion law (D) Scaling law (D) Law of mass action

Q.5. Vth is threshold voltage of transistor at which
(A) MOSFET is ON (B) OFF (C) Half Voltage (D) None of the above

Q.6. Technology is related to
(A)Channel Length (B) Channel Width (C) Oxide Thickness (D) Size of MOSFET

Q.7. MEMS is
(A) Microelectromechanical sensors (B) Macrosystems (C) Microscopic electromechanical sensor (D) None of the above

Q.8. The concept of trench capacitance is there in
(A)DRAM (2) SRAM (C) ROM (D) None of the above

Q.9. LOCOS technique is related to
(A) Oxidation (B) Diffusion (C) Ion implantation (D) Device Isolation

Q.10 Which of the following is not MEMS
(A) Pressure sensor (B) Air bag (C) Cantilever (D) All of the above

Q.11 which of the following is fast adder
(A) Manchester carry chain (B) London carry chain (C) ashir.on carry chain (D) None of the above

Fig.5: Pre-requisite test question paper

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PRINT

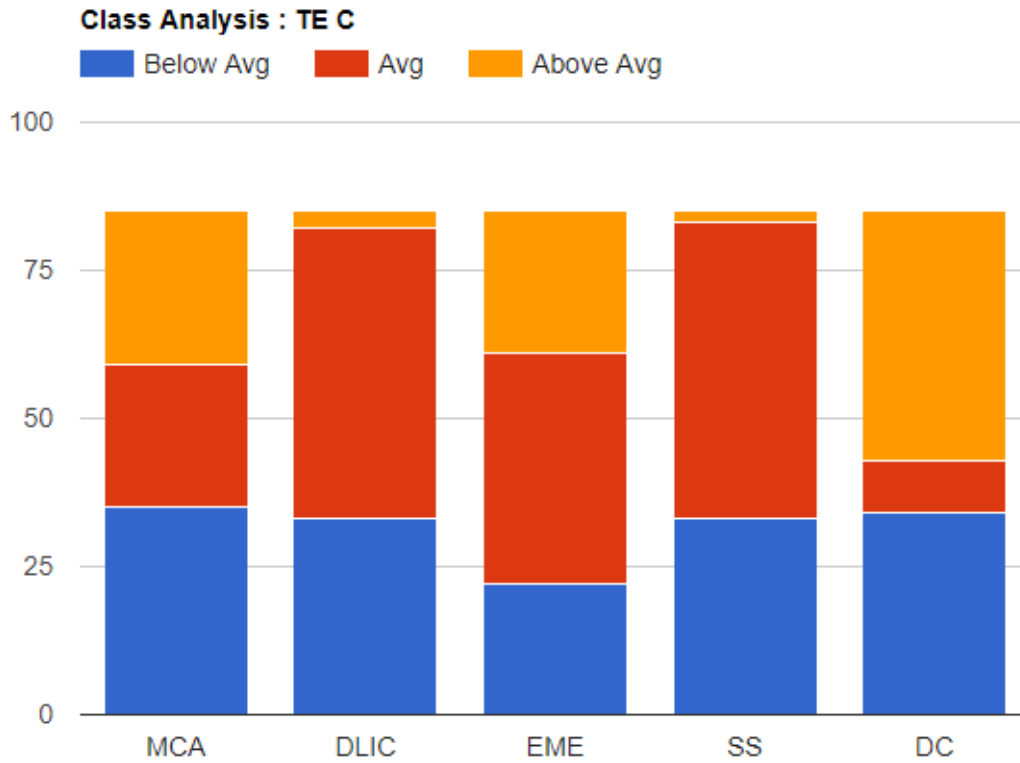Barchart denotes the number of students, not percentage

Fig.6: Prerequisite Test Result Analysis.

- **Assignments:**
  - ➢ At least 3 assignments covering entire syllabus are given. The faculty takes utmost care while mapping assignments to all COs.

ASSIGNMENT DETAILS

Ramrao Adik Institute of Technology, Nerul

Department :	ELECTRONICS				
Name of Subject :	CVD			Subject Code :	EXC801
Class :	B.E.	Division :	EL–C	Semester :	VIII
Name of Faculty :	SUSHMA KODAGALI			SDRN. No.	313

Question No.	Assignment – 1		Assignment – 2		Assignment – 3	
	Course Outcome (CO)	Marks	Course Outcome (CO)	Marks	Course Outcome (CO)	Marks
Q.1. A	CO2	6	CO4	8	CO1	5
Q.1. B						
Q.2. A	CO2	5	CO4	5	CO2	6
Q.2. B						
Q.3. A	CO1	8	CO5	12	CO3	6
Q.3. B						
Q.4. A	CO3	11	CO6	5	CO4	6
Q.4. B						
Q.5. A					CO5	5

Fig.7: Teaching and Learning Process.

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- **Internal Assessment:**

  ➢ Two tests must be conducted in each semester which should cover at least 80% of syllabus. The average marks of both the tests will be considered for final Internal Assessment.

TERM TEST DETAILS

Ramrao Adik Institute of Technology, Nerul						
Department :	ELECTRONICS					
Name of Subject :	CVD			Subject	EXC801	
Class :	B.E.	Division :	EL-C	Semester :	VIII	
Name of Faculty :	SUSHMA KODAGALI			SDRN. No.	313	

Question No.	TERM TEST – 1		TERM TEST – 2	
	Course Outcome (CO)	Marks	Course Outcome (CO)	Marks
Q1. A.	CO1	8	CO4	13
Q1. B.				
Q2. A.	CO2	11	CO5	12
Q2. B.				
Q3. A.	CO3	11	CO6	5
Q3. B.				

Fig. 8: Term Test details in DCF mapping with COs.

- **Implementation of gradeME software:**

  ➢ Department has taken initiative to implement gradeME software for online assessment of laboratory work. Faculty designs the laboratory work as per subject COs and upload the same in the application software.
  ➢ This software generates instant evaluation, automated feedback performance report and assignments report .This process helps to enhance web based

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learning process among the students and practice more experiments within stipulated time period.

➢ Faculty members can view reports generated by software and accordingly can evaluate the students' performance.
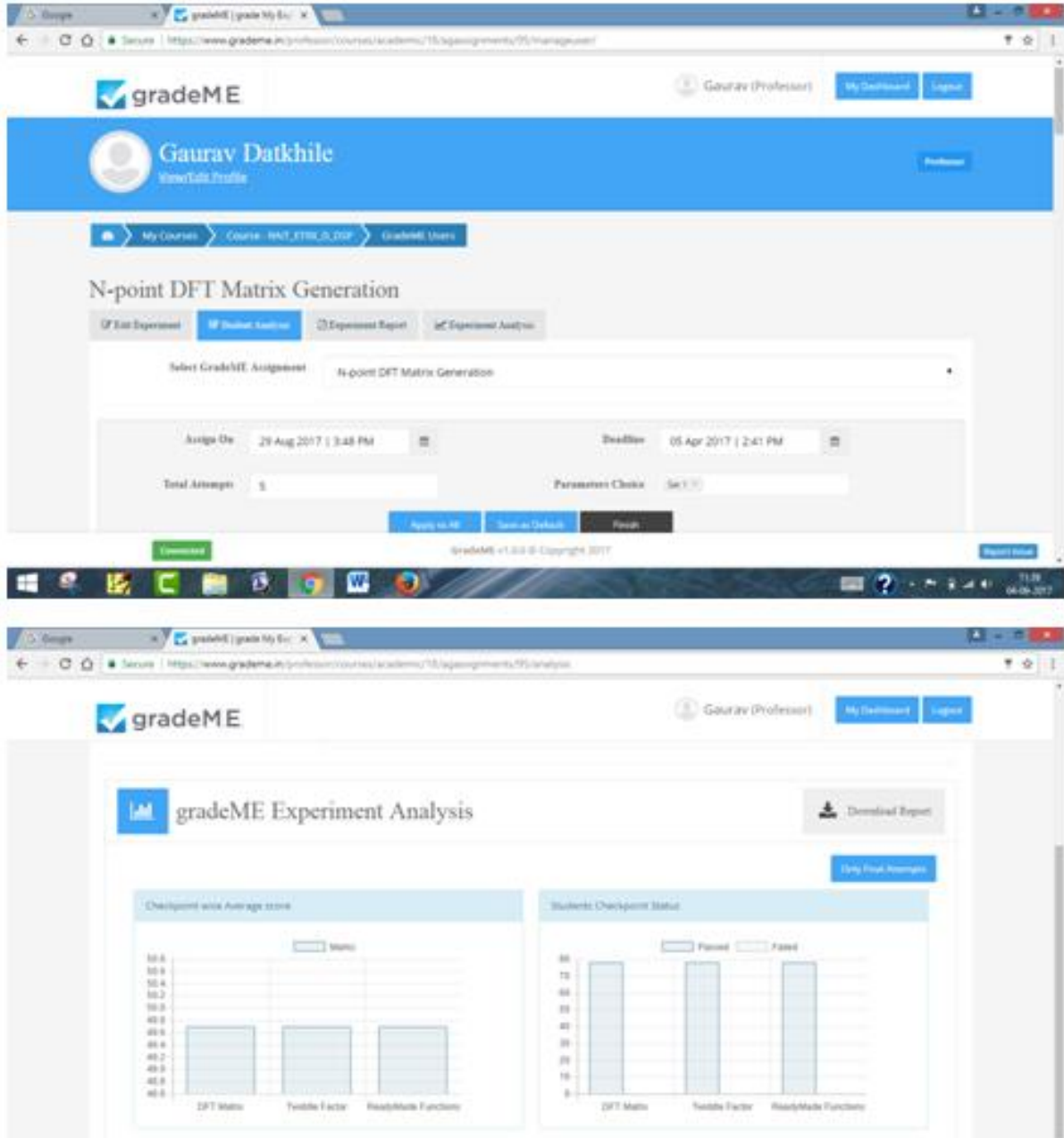

Fig. 9: GradeME Implementation details.

- **Use of Various instructional methods and pedagogical initiatives:**

  - ➢ **Interactive learning**: The faculty use cybernetics interactive board to deliver the lectures. Students are also encouraged to actually interact during the lecture hour by getting the doubts clarified on the spot.

Fig. 10: Smart Board lecture

  - ➢ **Project-based learning**: At the start of the semester faculty members are instructed by DQA members to float at least five project topics of their areas. Students are allowed to choose one topic and are made aware about current industrial progress. Some projects are allotted to interested students to get more conversant with current technologies.

  - ➢ **Computer-assisted learning**: The Department has maximum number of laptops, printers, LCD projectors, application software's and system software's with wireless connections. These are effectively used for teaching. Each faculty in the department is equipped with laptop.

  - ➢ **Broadcasting of NPTEL Lectures:** NPTEL provides E-learning through online Web and Video courses for various streams. The basic objective of broadcasting NPTEL videos is to devise basic concepts related to courses and also create awareness among the students regarding current trends in electronic industries.

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Fig. 9: NPTEL Screening.

> **Learning Management System (LMS):** Students are encouraged for self-learning, i.e., they learn from internet i.e. web-based learning from LMS Portal. Faculties are asked to upload no of lectures as per given in Mumbai University syllabus. Along with lectures relevant reading materials, video links, question banks, quiz, discussion forums are uploaded to make learning process more interactive.

Fig. 11: Student performing LMS activity.

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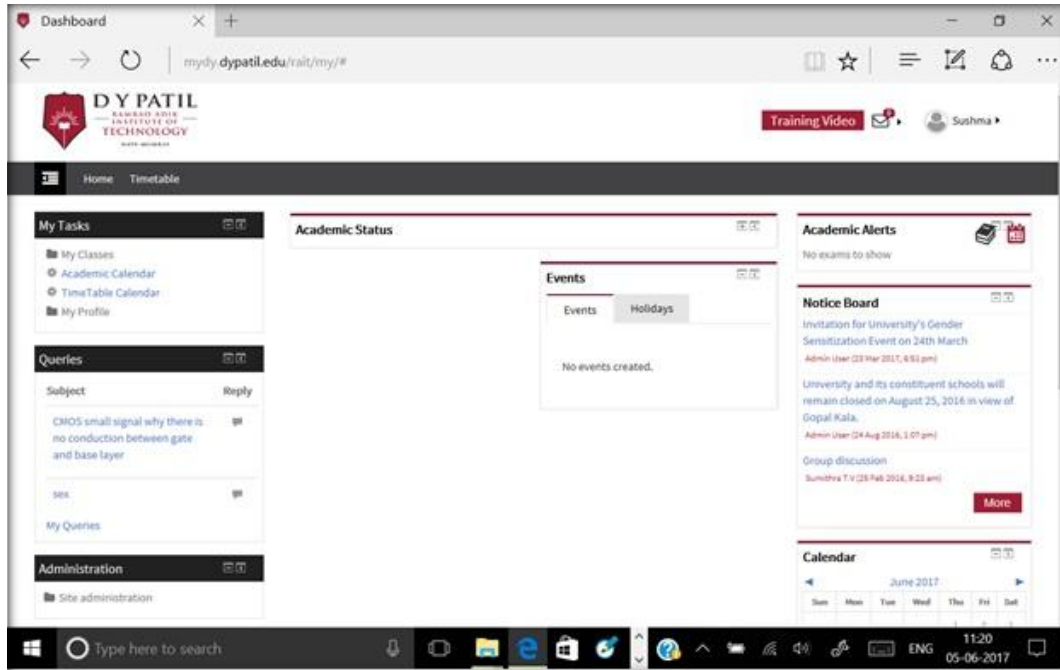
Fig. 11: Student performing LMS activity.

- **Methodologies to support weak students and encourage bright students: Guidelines to identify weak students:**

  ➤ The Class Counsellors regularly conduct meetings with students regarding their progress and grievances at the end of each month. CCs identify students who scored less marks in their internal assessment test. Under the HOD's direction, the counsellors evaluate the students' progress and same is also intimated to their parents.

  ➤ Class Counsellor also identifies bright students scoring good in term test exam as shown in figure 9 thereby actions are taken by HOD of the department.

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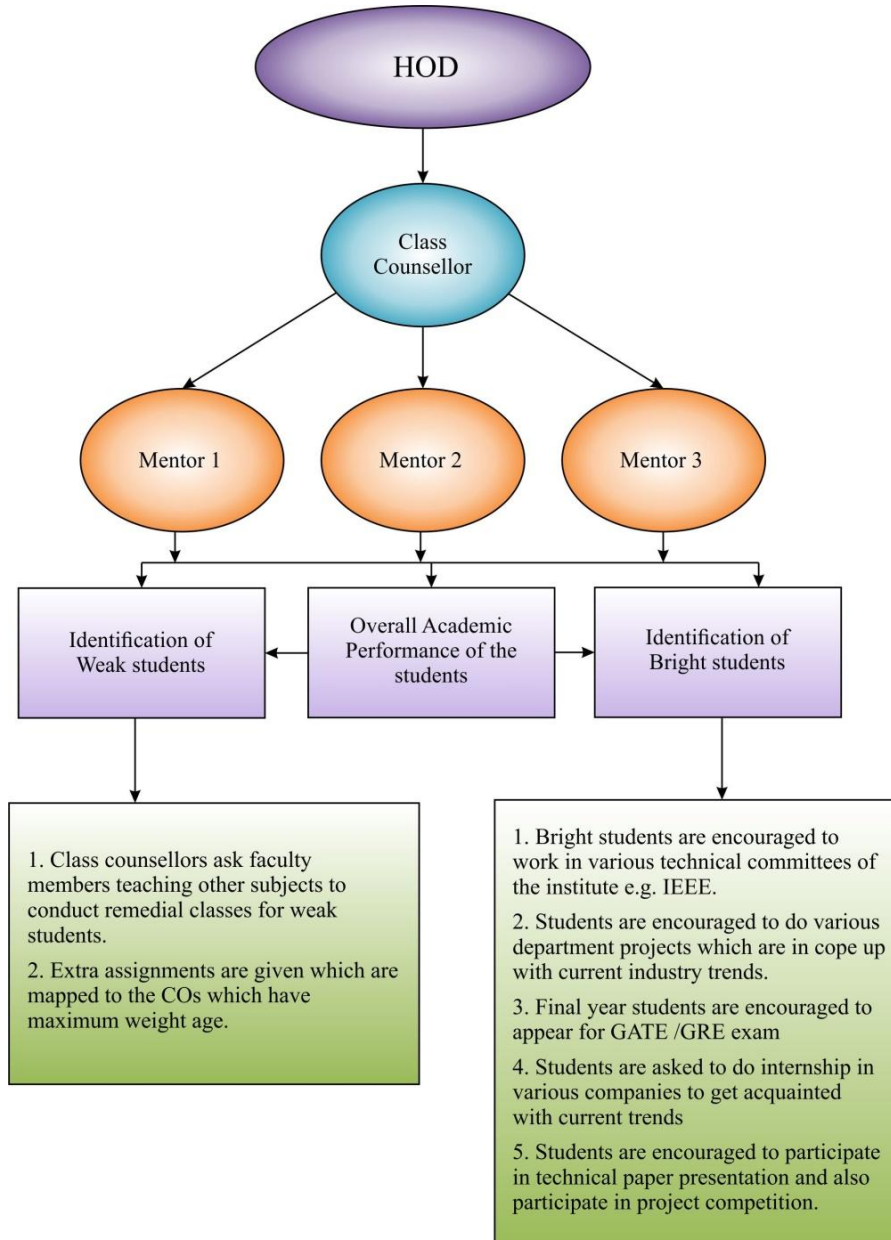*Department of Electronics Engineering*

Fig. 12: Process for Encouraging Bright Students and Assisting Weak Students.

University of Mumbai has laid down the number of days that would be available for teaching and evaluation. The subject teacher and the departments take utmost care to complete teaching and evaluation within the stipulated period.

3. **Evaluation to improve quality of Teaching & Learning:**

As per guidelines issued by University of Mumbai, evaluation system of each individual subject varies somewhat in the pattern but the categorization is same. The guidelines are given below:

- **Internal Assessment (IA):** Two tests must be conducted within a semester that should cover at least 80% of the syllabus. The average marks of both the tests will be considered for final Internal Assessment.

TERMWORK CALCULATION

Sr. No	Subject Code	Roll No	Name of Student	Batch	TT1	TT2	Journal	Assign1	Assign2	Assign3	Attd	Viva	Attnd (%)	Journal (10)	Assign (05)	Attd (05)	Viva (05)	TW (25)	IA (20)
			Ramrao Adik Institute of Technology, Nerul																
			Department : ELECTRONICS																
			Name of Subject : CVD — Class : B.E. — Div : EL-C — Semester : VIII — Total Number of Lectures Conducted : 31																
1	EXC801	13EE1034	RAO POORNIMA RAGHAVENDRA	C1	29	16	C	5	5	4	24		77.4	6	5	4	2	17	15
2	EXC801	13EE1005	SALUNKE SANKET MANIK	C1	18	18	C	4	5	5	27		87.1	6	5	5	2	18	12
3	EXC801	13EE1066	SARODE SHUBHAM YADAV	C1	20	3	C	5	5	4	27		87.1	6	5	5	2	18	8
4	EXC801	13EE1168	SAVANT PRIYANKA ARVIND	C1	15	18	C	5	5	5	27		87.1	6	5	5	2	18	11
5	EXC801	13EE1024	SHEDGE MAITHILI PRAMOD	C1	12	12	C	4	5	4	18		58.1	6	5	3	2	16	8
6	EXC801	13EE1021	SHINDE NIRANJAN NARESH	C1	26	12	C	5	5	4	25		80.7	6	5	4	2	17	13
7	EXC801	13EE1081	SHINDE SUPRIYA DILIP	C1	13	12	C	4	5	5	21		67.7	6	5	3	2	16	9
8	EXC801	13EE1172	SINGH VAISHNAVI DINESH	C1	21	18	C	5	5	4	21		67.7	6	5	3	2	16	13

Fig. 13: Internal Assessment evaluation details.

- **End Semester Examination:** Question paper will comprise of 6 questions, each carrying 20 marks. The students need to solve total 4 questions. Question No.1 will be compulsory and based on entire syllabus. Remaining question (Q.2 to Q.6) will be selected from all the modules. Figure 11 shows the university marks entered in related subject to calculate EPI, CO attainment.

- **Term Work/ Tutorial:** At least 03 assignments for each course covering entire syllabus must be given during the semester. The assignments should be students centric and an attempt should be made to make assignments more meaningful, interesting and innovative. Term work assessment must be based on the overall performance of the student with every assignment graded on timely basis.

UNIVERSITY MARKS ENTRY

Ramrao Adik Institute of Technology, Nerul								
Department :	ELECTRONICS							
Name of Subject :	CVD				Class :	B.E.		
Theory (Out of) Marks :	80	Oral/Practical (Out of) Marks :		0				
EPI (in %) of Theory:	48.72	EPI (in %) of OR/PR:		0				
Passing Percentage of Theory:	92.31	Passing Percentage of OR/PR:		0				
CO Attainment of Theory:	52.56	CO Attainment of Oral/Practical:		0	Avg. CO Attainment			52.56
Level of Attainment for External Assessment :	0							
Sr. No.	Subject Code	Roll No	Name of Student	Batch	P/AB for	Theory Marks	P/AB for OR/PR	Oral/Practical
1	EXC801	13EE1034	RAO POORNIMA RAGHAVENDRA	C1	p	46		
2	EXC801	13EE1005	SALUNKE SANKET MANIK	C1	p	44		
3	EXC801	13EE1066	SARODE SHUBHAM YADAV	C1	p	44		

Fig. 14: University Marks Entry in DCF.

- **EPI calculation:** Employee Performance Index (EPI) for each subject is aggregated by taking into account result, publications, feedback, contribution to the department, contribution to the institute, etc. Each faculty at the end of semester calculates performance index called EPI, which will convey parameters like average performance of class, pass percentage, and number of students above class average. The faculty compiles EPIs for all the subjects he/she has handled in an academic year. Based on these EPI, Academic Performance Index (API) of the faculty is computed, which is a barometer of academic performance.

4. Feedback Mechanism:

- Student online feedback on teaching faculty on content and delivery through digitalized feedback system where student provide the feedback of each subject, and this feedback is taken into consideration while assigning that subject to the faculty next time.
- Student feedback on CO-PO attainment.
- Feedback from Dean R&D on publications and research work done by teaching staff.
- Employee Performance Index (EPI) for each subject is aggregated taking into account Publications.
  a. Feedback from students.
  b. Calculation of Evaluative Performance Index for each subject.
  c. Contribution to the department and institute.

- HODs feedback to CMQA and Principal once in a semester.

- CMQA feedback to HODs and Principal to faculty on corrective Mechanism after analysing PO attainment received from each faculty through DCF.
- Online exit feedback of pass out students on the convocation day.
- Alumni feedback during their visit to college.
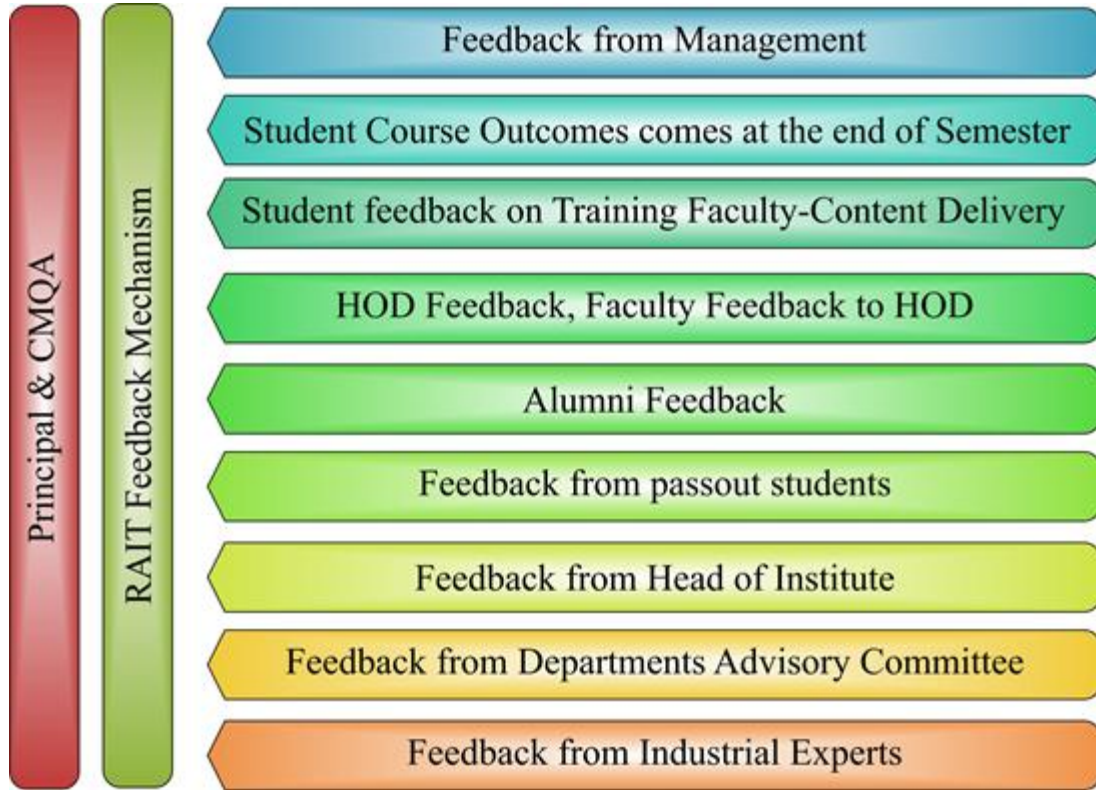- Employers' feedback.

Fig.15: Feedback Mechanism.

Fig.16: Students filling feedback forms.

5. Corrective Actions:

- The feedback received at each stage is evaluated by department DQA team, IQAC and CAC as the case be, and a comprehensive plan is drawn regarding
  - ➢ Enhancement in equipments, software's and hardware's.
  - ➢ Enhancements in leadership and skill set for enhancing employable skills.
  - ➢ Based on the feedback provided by the students, the concern faculty is counselled for improving their performance by delivering a lecture in front of DQA team, IQAC team, where improvisations are given by the respective members.

6. Impact Analysis of Teaching Learning Process:

- After passing out of the students, the feedback received from the industry persons regarding the students is excellent in terms of team work, ethics, and manners.
- There is tremendous increase in the recruitments of the students in various industries.
  - ➢ **2014-15:-82**
  - ➢ **2015-16:-74**
  - ➢ **2016-17:-132**
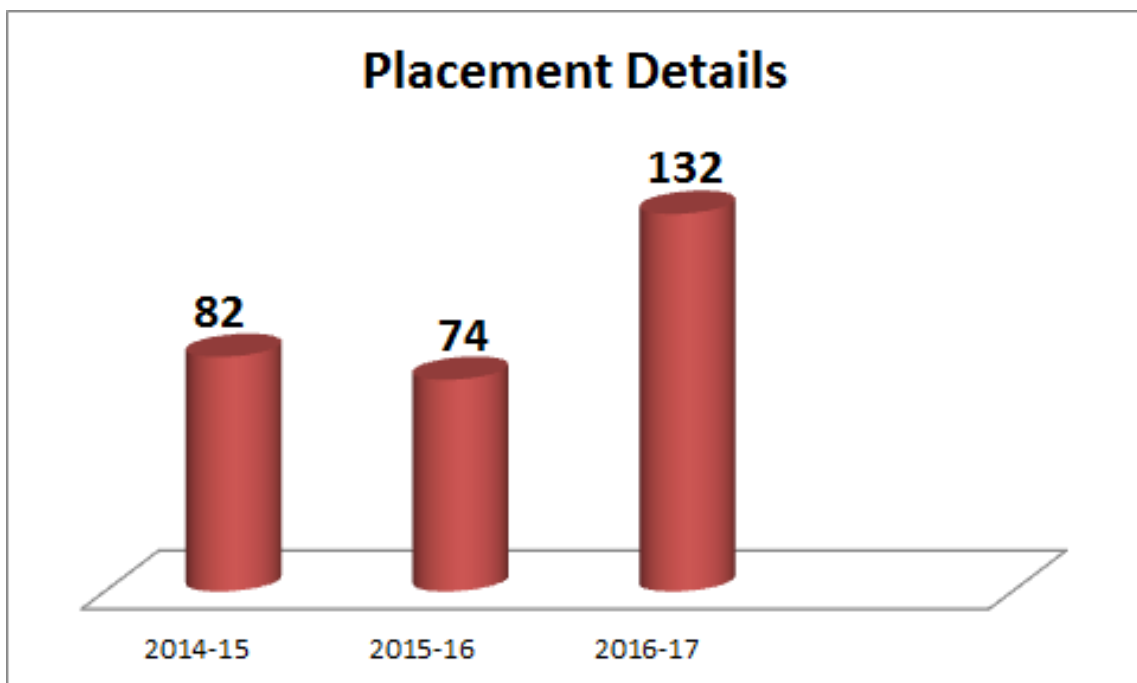 - ➢ **2017-18(ODD):-110**

Fig. 17: Placement Details.

Fig. 18: Placement group discussion session.

- There is increase in number of students going for higher education and also students appearing for GATE.
  - **2014-15:-15**
  - **2015-16:-18**
  - **2016-17:-28**

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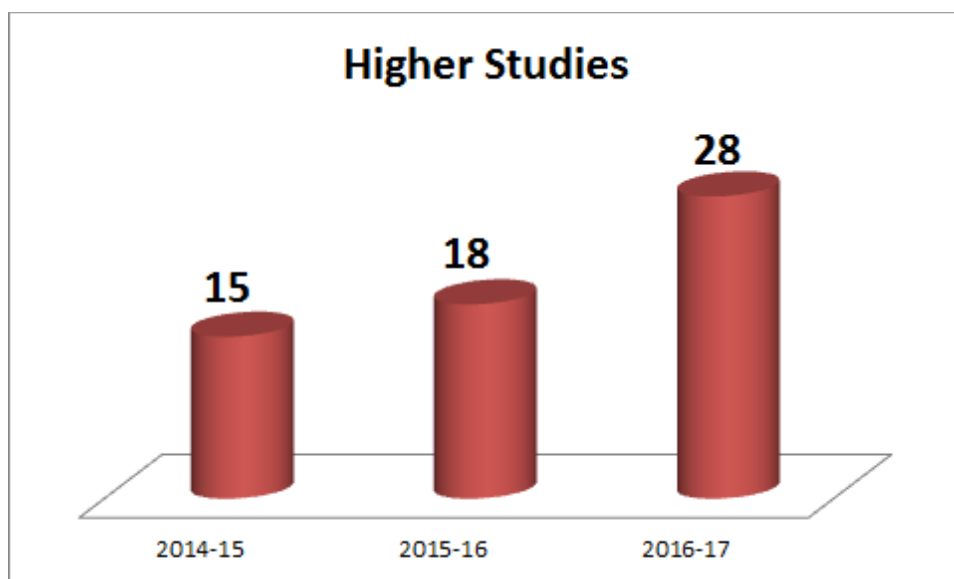NAVI MUMBAI

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Fig. 19: Higher Studies Details.

- Due to use of smart board lectures, sessions become more interactive.
- Students turned Entrepreneurs.

Table 1: List of Entrepreneurs Students.

Sr.No	Name of the student	Year of Passing	Organization
1	Rohan Stanley	2016-17	PYXIS Engineering
2	Kaustubh Dhonde	2016-17	AutoNxt Automation Pvt Ltd.
3	Onish Chamoli	2015-16	AO Enterprises
4	Prachi Bhatwal	2015-16	Phoenix
5	Aditya Hanchilal	2015-16	Modern Melody Brand Name-GetSetGig

- Improvement in PO attainment

DEPARTMENT PO EVALUATION

Ramrao Adik Institute of Technology, Nerul												
Department :	Electronics											
Academic Year :	2016-17											
Name of HOD:	Dr. Vishwesh Vyawahare							SDRN. No. :			571	

PO Attainment Data	Department PO Evaluation											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Direct Attainment	0.83	0.86	0.87	0.7	0.81	0.63	0.66	0.72	0.64	0.71	0.72	0.94
Indirect Attainment	2.71	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.69	2.7	2.69
80 % of Direct Attainment	0.66	0.69	0.7	0.56	0.65	0.5	0.53	0.58	0.51	0.57	0.58	0.75
20 % Indirect Attainment	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Final PO Attainment	1.2	1.23	1.24	1.1	1.19	1.04	1.07	1.12	1.05	1.11	1.12	1.29
Average of Articulation(PO Weightage	1.58	1.55	1.54	1.2	1.43	1.13	1.17	1.19	1.13	1.13	1.17	1.51
PO Attainment (in %)	75.95	79.35	80.52	91.67	83.22	92.04	91.45	94.12	92.92	98.23	95.73	85.43
Level of PO Attainment	2	2	3	3	3	3	3	3	3	3	3	3

Fig.20: Improvement in PO attainment over course PO matrix.

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B. *Quality of internal semester Question papers, Assignments and Evaluation*

- **Initiatives for improvement of quality of internal question papers, assignments:**

  1. A separate internal assessment committee i.e. central committee is to be formed at college level and a subcommittee to be formed at department level.
  2. As per university norms two internal assessment tests are to be conducted in each semester.
  3. Half of the syllabus should be covered in each internal assessment test.
  4. The Internal assessment test is to be conducted for a maximum of 30 marks.
  5. Test paper to be designed as per university course outcomes defined for each subject.
  6. Question paper template is to be circulated to all the faculty members by institute, fifteen days before the scheduled date of the test.
  7. Setting of Internal assessment test question paper is to be done based on all previous university exam papers, prescribed reference book, GATE questions, UPSC, IES questions are referred while setting the question papers
  8. Each question should be mapped to relevant CO.
  9. All Internal Assessment test question paper is to be set by subject-in- charge, in concern with other subject teachers.
  10. The Internal assessment paper should be approved by academic monitoring committee with counter sign by subject in charge, HOD, and co-ordinator of exam committee.
  11. The subject-in-charges has to submit the hard copy of question paper in properly sealed envelope.
  12. Time to time assessment and evaluation of Test I, Test II Marks, Continuous assessment grades for lab work, assignment grades should be done.

- **Assignments:**

  1. At least 3 assignments covering entire syllabus are given for each course within a semester.
  2. Each assignment is prepared such that the questions cover all CO's.
  3. The assignment must be student centric, more meaningful, interesting and innovative.
  4. It consists of frequently asked questions and some questions which require out of the box thinking.
  5. It is mainly theoretical, numerical and software based.
  6. Assignment issue and submission dates are announced by the respectively faculty members.
  7. Quiz, reading material, video and audio links related to the respective subjects are uploaded on LMS portal of RAIT for the students.

- **Implementation of Internal Question papers & Assignments:**

  1. A separate internal assessment test committee is formed at central and department level.
  2. Two Internal assessment tests are conducted in each semester. For the even semester internal assessment-1 test is conducted in the month of March and

Internal assessment-2 in April. For odd semester Internal assessment-1 test is conducted in the month of august and internal assessment-2 test is in October month.

3. Half of the syllabus is covered before each internal assessment test.
4. Each subject in internal assessment test carries maximum 30 marks.
5. Faculty ensures that each question in the test is mapped to relevant COs and proper choice of questions is given to attain maximum COs.
6. Question bank is prepared for each subject and difficult and important topics are discussed.
7. Subject in-charge in concern with other faculty member teaching that subject, set internal assessment test question paper by referring prescribed reference books and text books, all previous university exam papers, gate questions, UPSC and IES questions.
8. The questions are of two categories:
   a. Half of the questions are straight and can be answered by all students.
   b. Half of the questions need certain amount of thinking, analysis and mathematical knowledge to resolve question covered as per syllabus.

9. The Internal assessment paper is approved by academic monitoring committee with counter sign by subject in charge, HOD, and co-ordinator of exam committee.
10. The subject-in-charges submits the hard copy of question paper in properly sealed envelope.
11. Extreme care and secrecy is maintained in storing, printing and bundling of questions paper copies.
12. Awareness is created among students for avoiding any means of malpractices during exam.

- **Evaluation:**

1. Feedback is taken from students on content delivery and CO-PO mapping of each subject.
2. After every exam the faculties discuss the solution with students so that they perform well in final exam.
3. Marks scored by the student in each test are sent to their parents.
4. The average marks of both the tests are calculated for internal assessment.
5. Term work assessment must be based on the overall performance of the student with every assignment graded from time to time along with grades achieved by the students for continuous assessment of Laboratory work.
6. Test I, Test II Marks, Continuous assessment grades for lab work, assignment grades are entered in Digital Course File (DCF) on timely basis which generates term work and Internal Assessment marks.
7. The grade is converted to marks as per credit and grading system manual and should be added and averaged.

COURSE OUTCOME ATTAINMENT

Ramrao Adik Institute of Technology, Nerul			
Department :	ELECTRONICS	RAIT Admit Code :	13EL8
Name of Subject :	CVD	Subject Code :	EXC801
Class :	B.E.	Division : EL-C	Semester : VIII
Name of Faculty :	SUSHMA KODAGALI	SDRN. No. :	313

CO	Term Test - 1		Term Test - 2		Term Test 1 & 2	Assignment 1	Assignment 2	Assignment 3	Assignment (1, 2 &3)	Theory (Termtest +	Labs Performance	
	No. of Students Clearing CO's	CO Attainment (in %)	No. of Students Clearing CO's	CO Attainment (in %)	CO Attainment (in %)	CO Attainment (in %)	CO Attainment (in %)	CO Attainment (in %)	CO Attainment (in %)	CO Attainment (in %)	No. of Students Clearing CO's	CO Attainment (in %)
CO1	55	70.6	0	0	70.6	98.8	0	98.8	98.8	84.7	0	0
CO2	52	66.7	0	0	66.7	98.8	0	98.8	98.8	82.75	0	0
CO3	30	38.5	0	0	38.5	98.8	0	98.8	98.8	68.65	0	0
CO4	0	0	21	27	27	0	98.8	98.8	98.8	62.9	0	0
CO5	0	0	61	78.3	78.3	0	98.8	98.8	98.8	88.55	0	0
CO6	0	0	49	62.9	62.9	0	98.8	0	98.8	80.85	0	0

Fig. 21: Course Outcome Attainment.

C. Quality of student projects

1. Process initiated to improve quality of student projects:

a. Project identification:
- It is ensured that the students should take the project in alignment with advances in academia, research and industry.
- Faculty expertise in a concerned domain is a criterion for supervisors.
- There is a repository of all previously handled projects which is available to the students for study purpose.
- To choose the correct project, students are made aware of all options available in various fields by arranging a walkthrough of it by experts.

b. Project Allotment:
- Each supervisor has limited 3 number of project groups for supervision.
- One day in a week is dedicated for final year project students.

c. Continuous monitoring of the students' projects:
- Project co-ordinator in consultation with DQA team conducts mid-term review evaluation in a semester which is termed as Mock 1 and 2.Team of experts is selected to review quality of the students' projects.
- Supervisor continuously monitors students' weekly performance and gives valuable guidance on timely basis.

- Students are encouraged to undertake in-house projects and all necessary support is extended to them for the same.

d. Project Safety:

- Well-equipped laboratories with tested instruments are provided to the students to perform the project work.
- Students are instructed to switch on the equipment in front of supervisor to ensure safety.

e. Ethics among students:

- Supervisor tries to maintain and distribute the project work equally among the students to avoid any type of consequences and also to lift up the team spirit.
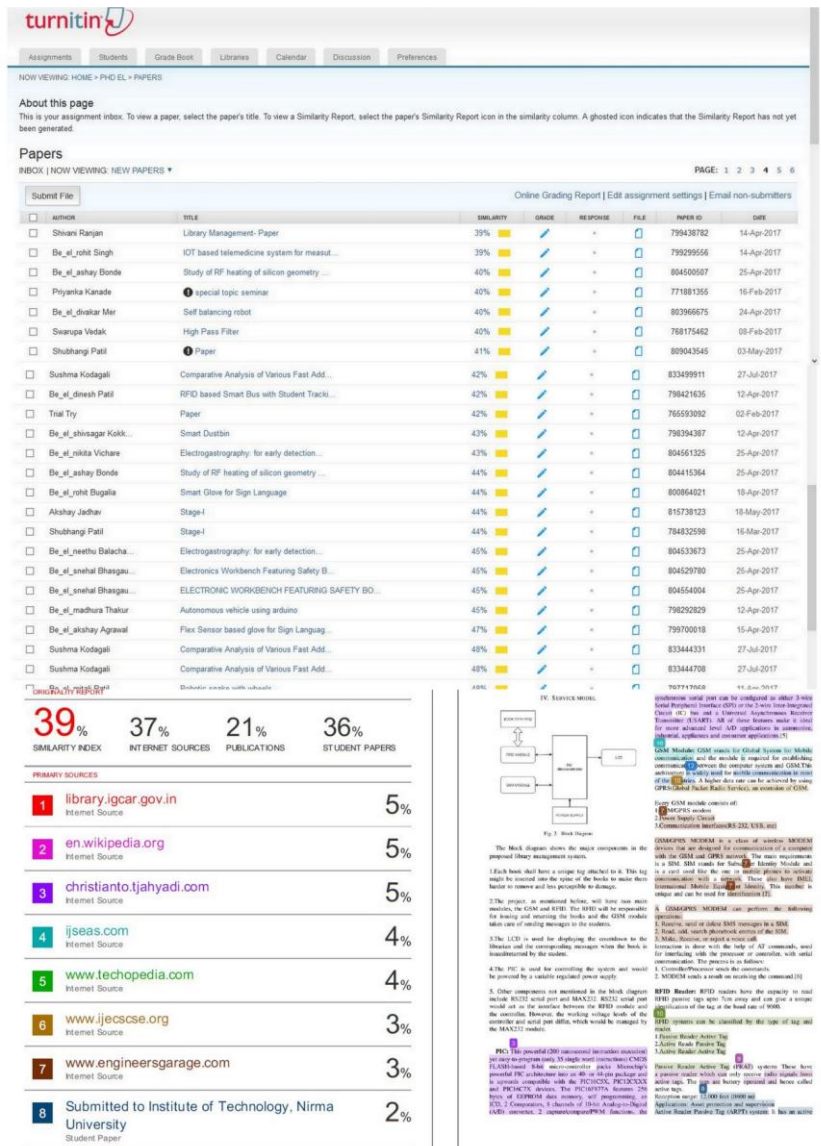

Fig. 22: Turnitin Reports of final year students report.

f. Cost support to the students' projects:

- College sponsors 100% funding as seed money for deserving projects.
- There is an availability of research literature from Springer, IEEE, etc for survey and study.
- Deserving projects are encouraged for patenting and full funding is provided.

2. Implementation of students' projects:

- Students are encouraged to showcase their projects in various project competitions like Avishkar Project Competition, e-Yantra project competition and exhibit their innovation and latest technology implementation.
- To improve the technical paper writing and project report writing, Plagiarism Checker software Turnitin is used by the department to check for plagiarism i.e. similarity index in writing paper.
- It is made compulsory for the students to write their project in LaTeX report writing software.
- Students are encouraged to publish their project work in reputed journals and conferences, also guidance is provided for the financial aid from various bodies like RAES for excellent pro
- Students are encouraged for product development which is other than their academic project work.
- Students are encouraged to register for the patents.
- Department conducts 3 Mock viva for final year students and one Mock viva for third year mini project students for improvement in the project work and presentation skill.

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Fig. 23: Student of Electronics Department in different project competitions.

3. Evaluation Scheme for Final Year Projects:

Table 2-5 depict the evaluation scheme for Mock project oral exam and final project oral exam.

MOCK-1
Table 2: Evaluation scheme for MOCK-1.

Course Outcomes	CO1: Discuss formulation of your project work	10M
	CO2: Highlight literature survey carried out for selection of your project work	5M
Report Writing	R1: Literature Survey is done scientifically	5M
	R2: Project Selection	3M
	R3: Referencing	2M

MOCK-2
Table 3: Evaluation scheme for MOCK-2.

Course Outcomes	CO2: Explain Specifications and requirements	10M
	CO3: Highlight design of your proposed system	20M
Report Writing	R1: Specification and requirement	10M
	R2: Design details	10M

MOCK-3
Table 4: Evaluation scheme for MOCK-3.

Course Outcomes	CO4: Implementation Details	10M
	CO5: Testing & evaluation process	20M
Report Writing	R1: Design Details.	10M
	R2: Result validation, conclusion & future scope.	10M

Final Exam

Table 5: Evaluation scheme for Final Exam.

Sr. No.	Performance Indicator	Term Work Marks	Oral Marks
1	Final report		
2	Demo with Presentation		
3	Questions and Answers		

After conduction of Mock vivas and final project oral exam, the marks of the projects are entered in Digital Course File as shown in Fig. 24-25.

Fig. 24: University Marks Entry in DCF.

PROJECT-A, MOCK-1 MARKS ENTRY

Ramrao Adik Institute of Technology, Nerul

Department :	Electronics							
Name of Subject :	Project-A							
Class :	B.E.	MOCK - 1		Course Outcome		CO1	CO1	
EPI (in %):	57.58			Marks for each		15	15	30

Sr. No.	Subject Code	Roll No	Name of Student	Batch	P/AB	Q.1.	Q.2.	TOTAL
1	EXC706	12EE1010	AKHADE KUNTAL RAVINDRA	A1	P	12	14	26
2	EXC706	12EE1083	ANIRUDH BALASUBRAMANIAN	A1	P	14	15	29
3	EXC706	12EE1026	APTE HRUSHIKESH JAYDEEP	A1	P	14	15	29
4	EXC706	12EE1005	ASWALE AKSHAY ANANDA	A1	P	14	15	29
5	EXC706	12EE2025	BALGUDE SURAJ SADASHIV	A1	P	13	13	26
6	EXC706	12EE1057	BEBAL SHAGUFTA ABDUL	A1	P	15	15	30

Fig. 25: Mock Marks Entered in DCF.

The fig. 26-27 shows the course outcomes assigned for project and its evaluation scheme.

PROJECT-A REPORT WRITING DETAILS

Ramrao Adik Institute of Technology, Nerul

Department :	Electronics			
Name of Subject :	Project-A		Subject Code :	EXC706
Class : B.E.	Division :	EL_A	Semester :	VII
Name of Faculty :	Sharmila Petkar		SDRN. No.	63

Q. No.	Question No.	Course Outco	Marks
1	Literature survey has been done scientifically	CO1	10
2	Problem or Project selection	CO1	6
3	Specification & requirements	CO2	4
4	Design details	CO3	6
5	Referencing	CO1	4

Fig. 26: CO mapping for report writing.

PROJECT-A, REPORT WRITING MARKS ENTRY

Ramrao Adik Institute of Technology, Nerul

Department :		Electronics						CO 1	CO1	CO2	CO3	CO1	
Name of Subject :		Project-A											
Class :	B.E.				Course Outcome			CO 1	CO1	CO2	CO3	CO1	
EPI (in %):		55.3			Marks for each			10	6	4	6	4	30
Sr. No	Subject Code	Roll No	Name of Student		Batch	P/AB	Q.1.	Q.2.	Q.3.	Q.4.	Q.5		TOTAL
1	EXC706	13EE1031	ADHIKARY PRARTHANA B		A1	p	5	3	3	4	2		17
2	EXC706	13EE1071	AHIRWAR ANIL DEVENDRAKUMAR		A1	P	5	3	3	4	2		17
3	EXC706	13EE1070	AMBERKAR ABHISHEK NANDKUMA		A1	P	9	6	4	6	3		28
4	EXC706	13EE1141	ANUSHA HARIKUMAR		A1	P	5	3	4	3	2		17
5	EXC706	13EE1030	ASHTAPUTRE VIKRANT ASHOK		A1	P	5	3	4	3	2		17
6	EXC706	13EE1075	AVERE SANDIP GANPAT HIRA		A1	p	6	4	4	4	3		21
7	EXC706	13EE1110	BANERJEE MEGHA RAJKUMAR		A1	P	9	4	3	3	3		22
8	EXC706	13EE1121	BHATTACHARYA ANIMESH D.		A1	P	7	4	4	6	4		25

Fig. 27: CO-PO mapping for evaluation of projects.

Ramrao Adik Institute of Technology, Nerul

Department :		Electronics									RAIT Admit Code :		13EL7	
Name of Subject		Project-A									Subject Code :		EXC706	
Class :		B.E.				Division :	EL_A				Semester :		VII	
Name of Faculty :		Sharmila Petkar									SDRN. No. :		63	

	Weightage	Course Outcom	CO Attain	P_	P₁	P_	P₄	P_	P₆	P₄	P₁	P₇	P₇	P₄	P₁	P_
Project A	30	CO1	94.15	8.5	8.5	8.5	0	0	0	2.8	0	0	0	0	0	0
		CO2	95.9	2.3	8.6	8.6	2.3	0	2.3	0	0	8.6	0	0	0	0
		CO3	99.45	0	0	3	0	3	0	3	0	6	3	0	0	0
		CO4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project B	70	CO1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		CO6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project-A PO Attainment				94.67	95.12	96.6	96	99.56	96	97	0	97.4	99.67	0	0	0
Project-B PO Attainment				0	0	0	0	0	0	0	0	0	0	0	0	0
PO Attainment (in %)				95	95	97	96	100	96	97	0	97	100	0	0	0

Fig. 25: PO attainments for students' project.

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The Fig. 24 shows the PO attainment for the final year project DCF. A committee consisting of Head of the Department, Professors and Project Coordinator are responsible to identify the merits and hence decide the best project for the respective years.

- Evaluation Scheme for Third Year Mini Projects:

Table 6-7 depict the evaluation scheme for TE Mini project oral exam.

MOCK-1

Table 6: Evaluation scheme for Third Year Mini Projects MOCK-1.

Course Outcomes	CO1: Problem definition , Literature Survey and requirements	10M
	CO2: Overview and design of system	10M
	CO3: Software and Hardware Implementation	10M
	CO4: Testing of Project system	4M
	CO5: Results	4M
	CO6:Presentation and originality of the mini project and future scope	2M

Final Exam

Table 7: Evaluation scheme for Third Year Mini Projects Final Exam.

Sr. No	Performance Indicator	Term Work Marks	Oral Marks
1	Final report		
2	Demo with Presentation		
3	Questions and Answers		

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- **Best Project Evaluation scheme**:
  Table 8 shows the evaluation scheme for Best project.

Table 8: Best Project Evaluation scheme.

Sr. No.	Performance Indicator	Marks
1	Innovativeness & creativity of the project	(10)
2	Review of literature& related studies about the project	(10)
3	Implementation Strategies	(10)
4	Question and Answer	(10)

- **Best Projects:**

Table 9: Projects Awards.

AY -2017-18

Sr. No.	Project Name/Event	Members	Competition	Levels cleared/Awards Won
1	Omni Crawler	Girish Giri Ketan Salvi Mukesh Prajapati	Annual Tech-Fest Matrix	First Prize
2	Satellite	Girish Giri Mehul Viraj Rane	CANSAT workshop	Second Prize

AY 2016-17

Sr. No.	Project Name/Event	Members	Competition	Levels cleared/Awards Won
1	Bothoven (Arena Navigation)	Sandeep (T.E.) Varun (T.E.)	e-Yantra Robotics Competition-016, IIT Mumbai	Level-1 Clear
2	Error Bot	Divya Shah(Mentor) Vaibhav Kadam(T.E.) Pramod J(T.E.) Saket Seshdri(T.E.) Anay Ghatpande(T.E.)	eYIC-2017,IIT Mumbai	Level-1 Clear
3	FPGA Based Sleep stage Classification	Rohit Chaurasiya(Mentor) Rohan Stanley(B.E.) Annanya Iyer(B.E.)	Zee-News Young Talent Award	Level-1 Clear
4	Poster Presentation	Pooja S. Patil Akshay Jadhav Priya Khot Sameer Chikne	Indian Youth Science Congress, UoM	Participated
5	Omni Crawler	Girish Giri	ELECTRO WIZ2017 Inter collegiate project competition under SYNERGY 17 at Datta Meghe College of Engineering	Consolation
6	FRDKL25Z Based gesture controlled wheel chair	Shambhavi Kale Nilesh Kene	ELECTRO WIZ2017Inter collegiate project competition under SYNERGY 17 at Datta Meghe College of Engineering	First Prize
7	Arduino based MPPT for solar charged Controller	Akshay Kharche Aditya Konde Pratik Kadam	ELECTRO WIZ2017Inter collegiate project competition under SYNERGY 17 at Datta Meghe College of Engineering	Participated
8	Wireless Notice Board Using Bluetooth Technology	Sandeep Banerjee Varun Alur Shrinidhi Athanikar	NCATM 2017 A.C Patil College of Engineering & Management	Participated
9	IOT based Telemetric System for	Ojas Sonnis Rohit Singh Akshay Sunka	ICIOTAS -2017 Internet of Things and applications for smart	Participated

	Biomedicine		cities ,MIT Art Design &Technology, Pune27/28 April 2017	
10	Advanced Real time high performance time based three axis capacitive accelerometer	Akshay A Jadhav	ICATE 2017DMCE , Airoli	Participated
11	WSN with secure data discovery and dissemination	Deepali Ausekar	ICIOTAS -2017 Internet of Things and applications for smart cities ,MIT Art Design &Technology, Pune27/28 April 2017	Participated
12	Defending against various attacks in MANETs	Shubangi Patil	ICIOTAS -2017 Internet of Things and applications for smart cities, MIT Art Design &Technology, Pune27/28 April 2017	Participated
13	Cortic Pad	Rohan Stanley Ananya Iyer	NMIMS Ulectro 2017Project Competition	Third Prize
14	Fractional Calculus using Java	Ruchita Gupta Shagufta Bebal Rutuja Mhatre	NCATM,2016 A.C Patil college of Engineering	Participated
15	Car security and Detector	Dipesh Sakharkar Kanchan Sarode Chaitali Patil	International conference on advanced trends in Engineering Datta Meghe College of Engineering(7 &8 April 2017)	Presented Paper
16	Self-balancing Robot	Divakar Mer Sanju Pandiath Suryaprakash Pasi	International conference on advanced trends in Engineering Datta Meghe College of Engineering(7 &8 April 2017)	Presented Paper

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NAVI MUMBAI

Department of Electronics Engineering

AY 2015-16

Sr. No.	Project Name/Event	Members	Competition	Levels cleared/Awards Won
1	Virtual Implementation of Digital Design Lab	Abishek Nautiyal Prithvi Shanbay Guide: /TPA	Avishkar 15-16 District	District Level Round Clear
2	Smart Electric meter	Rohan Stanley	Inter college project Competition ULECTRO16	Third Prize

AY 2014-15

Sr. No.	Project Name/Event	Members	Competition	Levels cleared/Awards Won
1	Virtual Laboratory Implementation using Labview	Shaswat Goyal Devdip Sen Pooja Patil	RAIT Project Competition	1st prize
2	Quick Alert System for car Accident	Rohan Stanley	IEEE MANIT students branch SRAJAN15	2 Prize
3	Real Time Remote monitoring of Vehicle Parameters	Chinmay Joshi Mahesh Pawar Avainash Gond Aniket Gharat Arabaz Doshani	RAIT Project Competition	Special prize

A project coordinator is appointed by the Head of the department /DQA who is responsible for planning, scheduling and execution of all the activities related to the student project work.

1. Project coordinator collects the data from all faculties regarding weekly progress report of the students.
2. She/ He is responsible for scheduling oral exams of projects groups of final year students.
3. Projects oral exam is conducted in front of experts from industries for evaluating projects.

- **Product Development:**

Table 10: Product Development.

Sr. No.	Product Name	Developed By	Technical Details	Applications	Cost	Year
1.	Omni Crawler	Girish Giri Ketan Salvi Mukesh Prajapati	The robot can operate on any terrain with the help of caterpillar wheel mechanism. The robot can move in orthogonal direction independent of two motor movement.	The Robot can be used for the exploration of uneven terrain where the movement is non predictable.	15,000	207-18
2.	CORTIC Pad (Acquisition board for ECG and EEG signals)	Mr.Rohit Chaurasiya Mr. Rohan Stanley Ms. Ananya Iyer	The product extract EEG signal with wearable version of analog front end, analyse EEG data on FPGA using time series analysis technique and artificial neural networks. An Android App has been developed to acquire data directly from headset and FPGA.	Wireless wearable EEG headset to help study brain activity during sleeping period with minimum physical stress exerted upon the subject.	50,000	2016-17
3.	Library Assistant Robot	Mrs. Divya Shah Mr.Vivek Bhandigari Ms.Viniti Chaudhary, Ms.Tanvi Dongaonkar Mr. Sushant Kadam	The product has a capability to send the book at proper place in library. It uses Raspberry Pi and Arduino Uno with CCTV camera installed on mechanical robotic arm	The robot enables the maintenance and organization of books in automated environment reducing human intervention.	10,000	2016-17
4.	Design and Implementation of DC microgrid for rural development	Dr. Vishwesh Vyawahare Dr. M. D. Patil Mr. Sushil Labde Mrs. Divya Shah Mr. Rohit Chaurasiya Mr. Gaurav Datkhile Mr. Pratik Kadam	The DC microgrid contains different Converters interlaced with FPGA communication network to support real-time energy management.	The product is about designing An hierarchical control of DC microgrid using DSP controller And communication between different DGs using FPGA based controller.	3,50,000	2016-17
5.	Android based App for fractional calculus	Dr.Vishwesh Vyawahare	First ever android based application for fractional calculus.	Useful for learning fractional calculus.	2,000	2016-17
6.	Wireless Surface Control using Accelerometer	Mr. Prathamesh Parulekar Mr. Rushikesh Joshi Mr. Nitin Nair Dr.Vishwesh Vyawahare	The gesture device in which a sensor is included to record the movement of hand in as pecific direction which will result in the motion of the robot in the respective directions. The surface to	Application in controlling of car using Accelerometer sensors connected to hand glove.	10,000	2016-17

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Department of Electronics Engineering

			be controlled and the gesture instrument are connected wirelessly through NRF modules.			
7.	Smart Notice Board	Mr. Sushil Labde Mr.Sandeep Banerjee Mr.Vaun Alur Ms. Shrinidhi Athanikar	The device contains Rasberry -Pi as central unit along with Bluetooth modem t otransfer and display different possible data(notices) from authenticated user via android app in real time.	Its wireless notice board that display messages on LCD monitor sent from user via mobile phone using android application	11,500	2016-17
8.	DC to DC Step down Converter	Dr.Vishwesh Vyawahare Dr. M. D. Patil Mr. Balu Bhusari Mr. Sushil Labde Mrs. Clara Arackel Mr. Pratik Kadam	The Product is aboutcontrolling of cascadedcontrol of voltage andcurrent topology andimplementation of it using DSP.	The converter is used as basic building block for applications like renewable control, Microgrid integration, Electric motor drive.	80,000	2016-17
9.	Employee attendance system using RFID technology	Ms. Prachi Bhatwal Mr. Onish Chamoli Mrs. Sharmila Petkar	It is an embedded based project made using ARM Processor. It use registered RFID card with unique number to monitor employee's attendance details.	The product was made keeping in mind the need of automating the attendance systems of employees in an organization. Itis currently being used by Nitiraj Engineers Ltd., Dhule, Maharashtra on a daily basis.	5,000	2015-16
10.	Automatic Shoe Polish Machine	Mr.Nitin Nair Mr.KunalNevrekar Mr.Prathamesh Parulekar Mrs.SharmilaPetkar	The system consist of Arduino platform with IR sensor and Six geared motors as actuators. The parameters are taken from the environment and suitable action (polish material, duration, etc) are decided and controlled through PWM motor driver.	Thus shoe sole cleaner is designed, considering all the parameters with respect to customer need in terms portability and also economically available.	2,500	2015-16
11.	Embedded system development for implementation of SVPWM	Mr. Nilesh Shinde , Dr.Vishwesh Vyawahare	The space vector modulation (SVPWM)technique is used for motor drive system with implementation on dSPIC33EP256MU806con	Application is in the domain of motor drive control in automobile.	5,000	2015-16

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Department of Electronics Engineering

Sr. No.						
				troller.			
12.	Energy Meter	Mr. Rohit Chaurasiya Mr. Rohan Stanley Ms. Ananya Iyer	The SEM consists ofMSP430F5529 as central unit along with ACS 712 hall effects sensors which provides isolation. The time averaging techniques is used in order to calculate the power consumption and the data is transferred through BLE via Android app to the end user.	This system is specially designed to tap voltage and current at the upstream of mains of a specific area, to calculate instantaneous active power values and to eventually calculate energy consumed by the system in that area.	11,000	11,000 2015-16
13.	D-Drive Kit	Ms. Divya Shah Mr.Rohit Chaurasiya, Mr. Devdip Sen, Mr. Shashwat Goyal	Its digital experimental kit with bread board, 15digital input, 15 LED outputs, 2 different clock signals with variable clock	It's a digital trainer kit used to perform Experiments in digital laboratories.	5,000	2014-15
14.	Bluetooth controlled power outlet	Mr. Mukesh Prajapati, Mr. Saurabh Wakode, Mr. Samadhan Hadmode, Mrs. Divya Shah	This Product is about power monitoring and control system of home based power port via Bluetooth Modem	In this product, Mobile phone sends data via Bluetooth communication to microcontroller to turn on and off power outlet.	1,000	2016-17

Table 11: Patents.

Sr. No.	Patent Name	Filled By	Year
1.	Passive Contrast Enhancement detection using statistical learning approach for digital image (Idea Patent)	Dr. Gajanan Birajdar	2016-17
2.	A Technology (Process) For Identifying Attainable, Measurable And Verifiable Goals And Objectives FR	Dr. M. M. Bhatia	2016-17

4. Impact analysis of the students' project:

- After improving quality of the students' projects 60% students have got good employment in the industries outside.
- Some of the 13% students are placed in top 50 universities worldwide for higher education.
- 25% Students have got good internships in other industries.
- After improvement in quality of the projects there is remarkably lifting up in PO attainment and PSO attainment.

D. Initiative related to industry interaction

(Give details of the industry involvement in the program such as industry-attached laboratories, partial delivery of appropriate courses by industry experts etc. Mention the initiatives, implementation details and impact analysis)

1. Initiatives for industry interaction:

To strengthen interaction with industries and to keep our students updated with the latest trends in electronics field, the department has entered into an agreement with the following companies.

MOUs were done with industries such as TCS, Gauranga, Eduvance, Yokogawa to emphasize on following factors.

- o Internship.
- o Project Workshop for Students.
- o Students specific Training.

Fig. 29: Industrial Training at Dahanu Thermal Power Plant

- **Students projects in Industries**

  1. Project done in Eduvance on PSoC.
  2. BLE based attendance system using IoT.

  Department of electronics has gained Centre of Excellence (COE) of Cypress semiconductor alliance program and Eduvance.

2. Implementation process for industry interaction:

Table 12 shows workshops and expert talks by various industries like Eduvance, NPCIL, COMSOL Multiphysics, Cadre Systems Design, etc.

Table 12: Workshop/Training/Expert Lectures Organized.

AY 2017-18

Sr. No.	Workshops/Training Programs	Industries Involvement	Date of conduction	Controlling subjects	Relevance to POs
1	3D Printing for Electronics Engineers	ARK Infosolutions Pvt. Ltd.	08-12-2017	MEMS	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
2	Expert Lecture on Engineering Life to a corporate professional: Important decision and choices	Reliance Industries Limited	04-10-2017	MITM	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
3	Motivational Talk for Self-development	Paradigms for Peak Performance, Melbourne, Australia	04-10-2017	BCE	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
4	Expert Lecture on Introduction to drivers	L&T automation	10-09-2017	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4

5	Expert Lecture Recent Trends in Power Electronics	L&T automation	10-09-2017	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
6	Expert Lecture on Introduction to Filters	VJTI	28-09-2017	Electrical Network	PO1,PO2,PO3,PO12, PSO3,PSO4
7	Expert Lecture on Communication in Microgrid Cell	ApLaB Pvt Ltd	13-07-2017	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4

AY 2016-2017

Sr. No.	Workshops/Training Programs	Industries Involvement	Date of conduction	Controlling subjects	Relevance to POs
1	Summer Industrial Training in Embedded System	Eduvance	27/06/16	Embedded System	PO3,PO4,PO5,PO8,PO9, PO11, PO12, PSO1, PSO4
2	A Webinar on COMSOL Multiphysics	COMSOL Multiphysics	16/12/2016	MEMS	PO3,PO4,PO5,PO8,PO10, PO11,PO12,PSO1,PSO4
3	An Expert talk on Power Electronics Simulation using MATLAB Simulink	Dr.Dhanashree Vyawahare(NPCIL)	24/09/16	Power Electronics I and II	PO3,PO6,PO7,PO12, PSO2,PSO3
4	Hands-on training on TCAD Simulation	Mr. Manish (Cadre System Design)	10/07/16	VLSI Design	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
5	Hands-on training on Programmable System on Chip (PSOC)	Mr. Aditya (Eduvance)	24/02/2017	Embedded System	PO3,PO4,PO5,PO8,PO9, PO11,PO12,PSO1,PSO4
6	Expert Lecture on IoT	Dr. Jonathan Joshi ,Eduvance	15/02/17	Embedded System	PO3,PO6,PO7,PO12,PO8, PSO2,PSO3

7	Expert Lecture by NPCIL,India	NPCIL	20/03/17	Power Electronics I and II	PO3,PO6,PO7,PO12 , PSO2,PSO3
8	Hands-on session on MATLAB & Simulink	Mr. Anand Vasappanavara (IISC, Banglore)	06/04/17	Power Electronics I and II	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
9	Vehicle level modelling & simulation in MATLAB	Mr. Anand Vasappanavara (IISC, Banglore)	07/04/17	Robotics	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
10	Concept of Black hole	Dr. Abhas Mitra (BARC)	06/04/17	EME	PO1,PO2,PO3,PO7,PSO2, PSO3
11	Career guidance to start-up	Mr. Ishan Bose(KrazyBee)	06/04/2017	MITM	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
12	Career Guidance in Embedded and VLSI System	Mr. Janak Mehata	24/01/2017	MITM	PO3,PO4,PO5,PO8,PO9, PO11,PO12,PSO1,PSO4
13	Discussion on GPU computing	Mr. Kale (NVIDIA, US)	24/01/2017	Embedded System	PO3,PO6,PO7,PO12,PO8, PSO2,PSO3

AY 2015-2016

Sr. No.	Workshops/Training Programs	Industries Involvement	Date of Conduction	Controlling subjects	Relevance to POs
1	FDP on Cypress PSoC Embedded System	Mr. Patrick Kane, Dr. Jonathan Joshi	07/01/16	Microcontroller and Application Laboratory	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
2	ARM University Program (U.K.) Certification course in Embedded System	Dr. Jonathan Joshi, Prof. Ganesh Gore	24/09/15	Embedded Systems	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
3	Knowledge about energy and nuclear physics in India.	Prof. R. K. Basu	27/04/16	MITM	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
4	Exposure to IoT	Dr. Jonathan Joshi	14/07/2016	Embedded Systems and	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4

Sr. No.	Workshops/Training Programs	Industries Involvement	Date of conduction	Controlling subjects	Relevance to POs
				Advance Networking Technologies	
5	Hands on session on TCAD simulation Software	Dr. Amit Saini (Cadre Systems Design)	29/02/16	VLSI Design	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
6	Visual TCAD software demo	Mr. Rakesh Cadre Systems Design	10/08/15	IC technology	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
7	Hands on Session on COMSOL Multiphysics	Mr. Ajay S S	16/12/15	MEMS	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4

AY 2014-2015

Sr. No.	Workshops/Training Programs	Industries Involvement	Date of conduction	Controlling subjects	Relevance to POs
1	Embedded GPU System	Mr. Viraj Padte	17/03/15	Embedded Systems	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
2	Internet of Things	Mr. Ankur S	02/03/15	Embedded Systems	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
3	Embedded Systems Fundamentals	Mr. Jagdish Bisawa	30/07/14	Embedded Systems	PO1,PO2,PO3,PO4,PO5, PO8,PO9,PSO1,PSO4
4	Discussion on India Based nutrino observatory	Prof. Naba Mandal TIFR	28/04/2015	EME	PO8, PO12, PSO1

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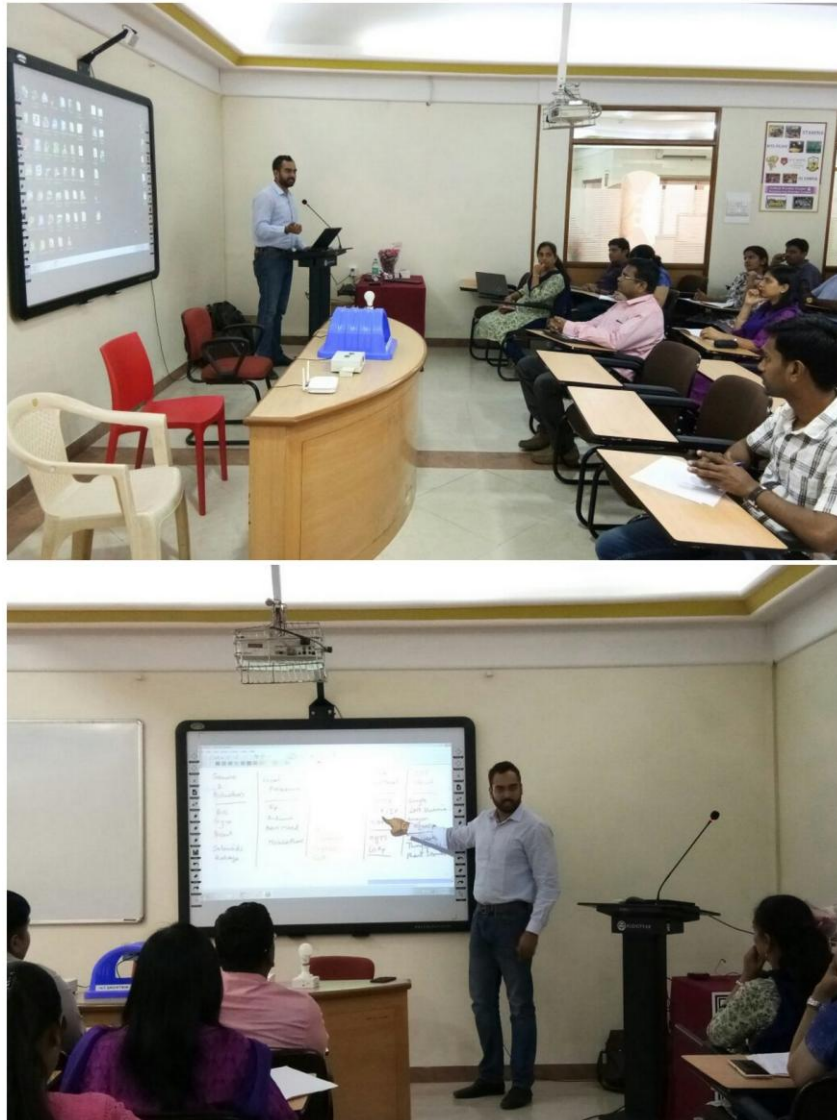NAVI MUMBAI

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Fig. 30: Talk on Exposure to IoT by Dr. Jonathan Joshi

- **Soft-Skill Programming:**

Department is actively engaging various programs based of aptitude, soft-skills and technology. These programs help students to acquire the knowledge, skills and experience necessary to identify, explore alternatives and succeed in their career. Likewise RAIT has ruled out almost 200 students on aptitude, soft-skills and programming fundamentals with the support of industry.

Table 13: Pre-placement Training.

Sr. No.	Course	Duration	No. of Participants	Controlling Subjects	Relevance to POs and PSOs
1	TIME- Aptitude, Quantitative, Data Interpretation, Verbal.	32 days	171	Project	PO4,PO5,PO6,PO7,PO8, PO9,PO10,PO11,PO12, PSO1,PSO2,PSO3,PSO4

2	Roy Erdington & Charles – Soft Skills, Personality Development, Communication, Interpretation Skills, Reading & Writing Skills, Mock Interviews.	32 days	171	Project	PO4,PO5,PO6,PO7,PO8, PO9,PO10,PO11,PO12, PSO1,PSO2,PSO3,PSO4

For industry interaction the training program is necessary for the students. The target audience for soft skill program is BE students and TE students. Department conducts such workshop for students to improve their coding, practices and communication skills which contribute to their final year project and placement. Table 14 shows the training programmes conducted for the students.

Table 14: Training Programmes.

Sr. No.	Name of the Industry	Type/Name of Interaction	Target Audience (% of Student)	Relevance to POs and PSOs
AY 2017-18				
1	RAIT Students & TPC	C Programming	**78**	PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12PSO1,PSO2,PSO3,PSO4
2		Basics of Electronics	**82**	
3		Embedded Programming	**36**	
4		PCB designing	**31**	
5		VHDL	**33**	
AY 2016-17				
1	T.I.M.E.	Aptitude Workshop for Final Year Students	90	PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO11,PO12PSO1,PSO2, PSO3,PSO4
2	Roy Eddington Charles & Associates	Soft Skill Workshop for Final year students	85	
3	Tata Consultancy Services (TCS)	Code Vita Awareness Seminar	92	
4	Ericsson Ericsson	Technical Training	94	
5	RAIT Students & TPC	JPMC Competitive Coding Workshop	92	
6	Tata Consultancy Services (TCS)	TCS Remote Internship	95	

		Program		
7	Tata Consultancy Services (TCS)	Bit coin & Blockchain Technology	93	
8	Tata Consultancy Services (TCS)	TCS Experiential Learning Program	90	
		2015-16		
1	T.I.M.E.	Aptitude Workshop for Final Year Students	94	
2	Roy Eddington Charles & Associates	Soft Skill Workshop for Final year students	95	
3	Roy Eddington Charles & Associates	Specific Training on C Programming Language	95	
4	TCS : Mr. Gaurav Gandhi &Mr. Nikhil Dabhole	Specific Training on JAVA Programming Language	96	
5	TCS : Mr.Yashwant Kulkarni	Campus to Commune : Industry Expectations from Fresh engineering Graduates	95	PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO11,PO12 PSO1,PSO2,PSO3,PSO4
6	TCS : Mr.Yashwant Kulkarni	Cloud Computing	94	
7	Teach for India	Workshop on Process and Activities of Teach for India	97	
8	J.P. Morgan Chase	Code for Good Seminar	98	
9	Tata Consultancy Services (TCS)	Post offer Connect Session	99	
10	Tata Consultancy Services (TCS)	Pre-Final year Connect	98	
11	Tata Consultancy Services (TCS)	Code Vita Awareness	94	

		Seminar		

		2014-15		
1	Energia Well Being	Workshop on how to improve self esteem by self meditation and self hypnosis	87	PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO11,PO12 PSO1,PSO2,PSO3,PSO4
2	T.I.M.E.	Workshop on how to improve self esteem by self meditation and self hypnosis	98	
3	Roy Eddington Charles & Associates	Workshop on how to improve self esteem by self meditation and self hypnosis	95	
4	RAIT	National Workshop on Computational Intelligence	96	
5	Google	Google Student Ambassdor Program	93	
6	INFOSYS	Aspirations 20:20	96	
7	TCS	MobiViZ	94	

3. Impact Analysis

- The effectiveness of this practice can be gauged by the great response of the participants for workshops. Nearly 80 % of the students participated in all workshops.
- Students picked up what they learnt at the workshops to implement their own mini project and also final year projects.
- Students gained from this exposure to incorporate an entrepreneurial spirit and project based thinking.
  - 2016-17 -2 students turned entrepreneurs.

o 2015-16- 3 students turned entrepreneurs.
- Table 15 shows year wise placement details

Table 15: Year wise placement details.

Sr. No.	Year	No. of students
1	2014-15	82
2	2015-16	74
3	2016-17	132
4	2017-18	110

- Table 16 shows the number of students for higher studies.

Table 16: Student details for higher studies.

Sr. No.	Year	No. of students
1	2014-15	15
2	2015-16	18
3	2016-17	28

- 75 % of Students are going for internships in various industries. Table 17 shows the improvement in overall PO attainment from 2015-16 to 2016-17.

Table 17: Improvement in PO attainment.

2015-16	PO-attainment	67.07	69.75	72.55	80.14	81.33	80.49	80.33	95.54	92.92	89.71	96.36	79.07
2016-17	PO-attainment	77.64	80.65	82.47	94.17	86.01	93.81	92.31	95.04	96.46	100	98.31	88.89

- COE, center of excellence thereby introducing the students to work in the advanced technical areas in various industries. Fig. 27 shows the interaction of the department with industries in various ways.
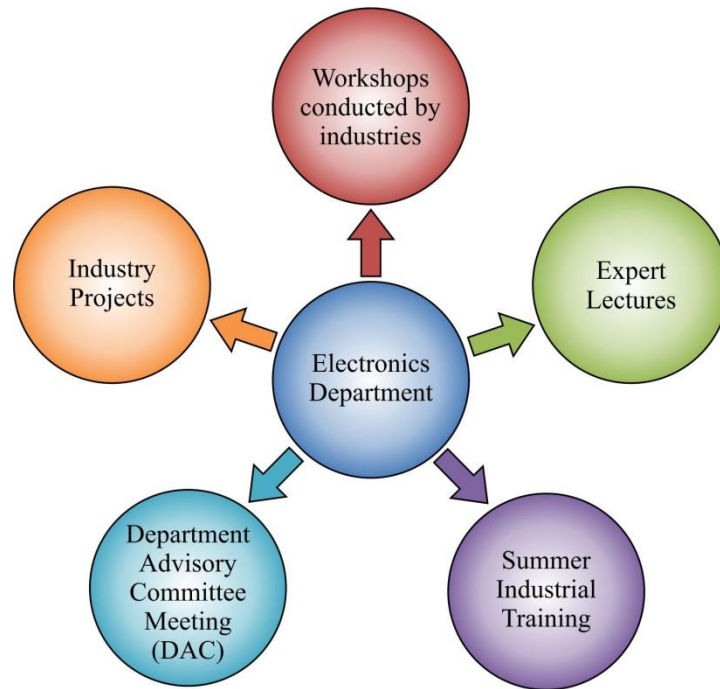
Fig. 31: Industry Interactions.

E. Initiative related to industry internship/summer training

Initiatives:
1. The students are encouraged to take up internship programs during their semester break.
2. Faculty members give the guidelines, suggestions, scope and contact details of industry persons if required to the students.
3. They also help the students by interacting with the industrial experts, provide the students recommendation letters and other necessary supports.
4. The alumni coordinator constantly interacts with alumni working in the industries and request them to provide necessary guidelines and support to the students.

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Implementation:

Fig. 32: Summer internship Program.

AY 2013-14

Table 18: Industry internship/summer training.

Sr. No.	Name of Company	No. of students	Contributing subjects	Relevant POs
1	JSW Steel Ltd.	1	Electronic Instruments and Measurements	PO1, PO2, PO4, PO12, PSO1,PSO4
2	Ascent Team	2	Modern Information Technology for Management	PO1,PO2,PO5,PO11, PSO2,PSO4
3	G.T.P.S Power station, URAN	6	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
4	Reliance Industries, Patalganga	2	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
5	Vital Electronics, Mahape	2	Electronic Devices	PO1,PO2,PO8,PO12, PSO1,PSO4
6	NPCIL	1	Power Electronics	PO1, PO2,PO3,PO12, PSO3,PSO4
7	AIR INDIA	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
8	BARC, Mumbai	19	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
9	Siemens Ltd.	2	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
10	LSP, Wardha	2	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
11	Emerson Network Power India	2	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4

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12	A.P.M. Terminds	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
13	L&T	2	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
14	M/S Reliance Infrastructure	1	Power Electronics	PO1, PO2,PO3,PO12, PSO3,PSO4
15	BSNL	1	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
16	ONGC	5	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
17	Elcome Integrated System	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
18	Reliance Industries Ltd.	2	Power Electronics	PO1, PO2,PO3,PO12, PSO3,PSO4
19	IIG, New Panvel	1	Discrete electronics circuits	PO1,PO2,PO8,PO12, PSO1,PSO4
20	COEP College, Pune	3	Microprocessor and Peripherals	PO1,PO2,PO4,PO8, PSO2,PSO4
21	Shiv Tech. Equipment Ltd.	1	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
22	Portescap	1	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
23	Reliance Communications	2	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
24	Siemens Ltd.	1	Power Electronics	PO1, PO2,PO3,PO12, PSO3,PSO4
25	Western Railway Larsen & Toubro	3	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
26	ECIL	2	Design with linear Integrated Circuits	PO1,PO2,PO4,PO8, PSO1,PSO4
27	NALCO	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
28	Print Electronics Pvt. Ltd.	1	Discrete Electronics Circuits	PO1,PO2,PO8,PO12, PSO1,PSO4

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| 29 | Bharat Bijlee, Airoli | 1 | Power Electronics | PO1,PO2,PO3,PO12, PSO3,PSO4 |

AY 2014-15

Sr. No.	Name of Company	No. of students	Contributing subjects	Relevant POs
1	L&T Infotech	2	Fundamentals of Communication Engineering	PO1,PO2,PO3,PO12 PSO1,PSO4
2	Mazgaon Dock	2	Advanced Instrumentation System	PO1,PO2,PO4,PO8 PSO1,PSO4
3	RCF, Thal	1	Modern Information Technology for Management	PO1,PO2,PO5,PO11, PSO2,PSO4
4	L&T Automation	1	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
5	Railways	1	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
6	Siemens	2	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
7	Ordinance Factory Ambernath	1	Electronic Devices	PO1,PO2,PO8,PO12, PSO1,PSO4
8	BARC	17	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
9	Reliance	1	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
10	L&T Business Park	1	Modern Information Technology for Management	PO1,PO2,PO5,PO11, PSO2,PSO4
11	Godrej	1	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
12	NPCIL	1	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
13	Siemens	1	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
14	BSNL	1	Fundamentals of Communication Engineering	PO1,PO2,PO3,PO12, PSO1,PSO4

AY 2015-16

Sr. No.	Name of Company	No. of students	Contributing subjects	Relevant POs
1	BARC	14	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
2	JNPT	5	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
3	L&T Infotech	1	Fundamentals of Communication Engineering	PO1,PO2,PO3,PO12, PSO1,PSO4
4	BEL	6	Fundamentals of Communication Engineering	PO1,PO2,PO3,PO12, PSO1,PSO4
5	Reliance	6	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
6	Railways	6	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
7	BSPT	1	Modern Information Technology for Management	PO1,PO2,PO5,PO11, PSO2,PSO4
8	ARDE Lab in DRDO	1	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
9	ONGC	6	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
10	HPCL	2	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
11	EMCO Limited	1	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
12	BSNL	6	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
13	Railtel	2	Computer Communication Networks	PO1,PO2,PO6,PO8, PSO1,PSO4
14	Angel Broking	1	Modern Information Technology for Management	PO1,PO2,PO5,PO11, PSO2,PSO4
15	TCS	2	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
16	Process Industries	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4

AY 2016-17

Sr. No.	Name of Company	No. of students	Contributing subjects	Relevant POs
1	JSW Steel Ltd.	1	Electronic Instruments and Measurements	PO1, PO2, PO4, PO12, PSO1,PSO4
2	Ascent Team	2	Modern Information Technology for Management	PO1,PO2,PO5,PO11, PSO2,PSO4
3	G.T.P.S Power station, URAN	6	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
4	Reliance Industries, Patalganga	2	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
5	Vital Electronics, Mahape	2	Electronic Devices	PO1,PO2,PO8,PO12, PSO1,PSO4
6	NPCIL	1	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
7	AIR INDIA	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
8	BARC, Mumbai	19	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
9	Siemens Ltd.	2	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
10	LSP, Wardha	2	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
11	Emerson Network Power India	2	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
12	A.P.M. Terminds	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
13	L&T	2	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
14	M/S Reliance Infrastructure	1	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4
15	BSNL	1	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
16	ONGC	5	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
17	Elcome Integrated System	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
18	Reliance Industries Ltd.	2	Power Electronics	PO1,PO2,PO3,PO12,PSO3,PSO4
19	IIG, New Panvel	1	Discrete electronics Circuits	PO1,PO2,PO8,PO12, PSO1,PSO4

20	COEP College, Pune	3	Microprocessor and Peripherals	PO1,PO2,PO4,PO8, PSO2,PSO4
21	Shiv Tech. Equipment Ltd.	1	Principles of Control System	PO1,PO2,PO3,PO7, PSO2,PSO4
22	Portescap	1	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
23	Reliance Communications	2	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
24	Siemens Ltd.	1	Power Electronic	PO1,PO2,PO3,PO12, PSO3,PSO4
25	Western Railway Larsen & Toubro	3	Electrical Machines	PO1,PO2,PO6,PO8, PSO1,PSO4
26	ECIL	2	Design with linear Integrated Circuits	PO1,PO2,PO4,PO8, PSO1,PSO4
27	NALCO	1	Advanced Instrumentation System	PO1,PO2,PO4,PO8, PSO1,PSO4
28	Print Electronics Pvt. Ltd.	1	Discrete Electronics Circuits	PO1,PO2,PO8,PO12, PSO1,PSO4
29	Bharat Bijlee, Airoli	1	Power Electronics	PO1,PO2,PO3,PO12, PSO3,PSO4

AY 2017-18

Sr. No.	Name of Company	No. of students	Contributing subjects	Relevant POs
1	TCS	1	Digital Communication	PO1,PO2,PO3,PO12, PSO1,PSO4
2	Incognito forensic foundation	1	DIP	PO1,PO2,PO3,PO12, PSO1,PSO4