Attainment Booklet

Department of Electrical Engineering

RCC Institute of Information Technology

Approved by AICTE, New Delhi and Affiliated to MAKAUT, W.B.
An ISO 9001 - 2008 & ISO 14001 - 2004 Certified Institute
A Unit of RCC Institute of Technology
An autonomous Society of Department of Higher Education
Govt. of West Bengal

Vision of the Institute

To develop RCCIIT as one of the most advanced technical institutes of the State by imparting technical knowledge and skill of the highest quality through the use of state-of-the-art technological tools and thereby producing technical manpower fit for industries, research organizations and academia and by establishing the culture of interdisciplinary research and innovation (to cater to the social needs) in a congenial, inclusive and transparent work environment created by unbiased and visionary leadership and participative management.

Mission of the Institute

- To produce well trained good human beings with ethics and values, good interpersonal skill, team spirit and leadership capability and concern for the society and environment
- To produce technical professionals with fundamental and cutting edge technological knowledge and skill, a flair for innovation and design, ability for analysis and application to meet the demands of real-life projects and challenges of research
- To select, groom and retain talented, qualified and committed faculty and staff under a fair and transparent HR policy
- To develop state-of-the-art infrastructure and learning resources for pursuing unhindered research and learning practices.
- To create congenial and inclusive work environment for all with zero tolerance on gender bias and ragging or harassment of any kind.

About the Department

The Department of Electrical Engineering (which is now accredited by National Board of Accreditation (NBA), New Delhi) started its journey in the year 2009 under RCCIIT and the first batch of students graduated in the year 2013. It is situated in the ground floor of the new campus of the Institute. The department offers Electrical Engineering (EE) undergraduate program that augments the liberal education to undergraduates and imparts well understanding of the subject, Electrical Engineering and its different aspects built on a foundation of Science, Mathematics, Computation, Engineering and Technology. Admissions for UG program in this department require a valid rank of WBJEE/AIEEE which is monitored through the Institutional Admission Committee following the guidelines of the Maulana Abul Kalam Azad University of Technology, previously known as the West Bengal University of Technology. The department also take admission under lateral entry scheme from the merit list of JELET conducted by West Bengal Joint Entrance Examinations Board. The present intake of this department is 60. The department has highly qualified and experienced faculty and staff members. The Department has well modernized class rooms, Faculty rooms and possesses exclusive laboratories as per university course curriculum. Apart from the academics, students are also encouraged for different extra-curricular activities like quizzes, seminars, workshops etc.

Vision of the Program (Electrical Engineering)

To create world class professionals who are globally competitive, capable of using and developing state-of-the-art technologies along with research and innovation in EE and allied fields.

Mission of the Program (Electrical Engineering)

- To provide education to the students that will enable them to meet the current and future needs of EE and possess diverse capabilities to pursue their careers successfully.
- To be research and innovation oriented so as to investigate and develop new technologies.
- To remain constantly agile to the needs of industry, environment and society so as catered to the needs of the nation and the global community.

Program Educational Objectives (PEOs)

The graduate will possess:

- Basic understanding of core electrical engineering built on foundation of physical science, mathematics, computing, and technology so as to pursue successful career/higher studies in Electrical Engineering.
- Broad based knowledge of Electrical Engineering suitable for research, development and innovation to meet diverse and multidisciplinary needs of industry and society.
- Adequate professional skills, to be analytical and logical so that they can quickly adapt to new work environment, assimilate information and solve challenging problems.
- Self-learning capability, leadership qualities with strong communication skills and working in teams.
- Capacity to be productive with ethical values, conscious about social and environmental issues with lifelong learning attitude.

Program Specific Outcome (PSOs)

At the end of the program, the students

PSO1: Proficiency in use of software & hardware required to practice Electrical engineering profession.

PSO2: Proficiency in developing wind & solar hybrid power generating systems.

PSO3: Development of wireless control & automation and real time simulations for prototypes.

Program Outcomes (POs)

Electrical Engineering Graduates of RCCIIT will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

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

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Correlation between Program Educational Objectives (PEOs) and Mission of the Department of Electrical

PEO No.	Statement	M1	M2	M3
PEO 1	Basic understanding of core electrical engineering built on foundation of physical science, mathematics, computing, and technology so as to pursue successful career/higher studies in Electrical Engineering.	3	3	3
PEO 2	Broad based knowledge of Electrical Engineering suitable for research, development and innovation to meet diverse and multidisciplinary needs of industry and society.	3	3	3
PEO 3	Adequate professional skills, to be analytical and logical so that they can quickly adapt to new work environment, assimilate information and solve challenging problems.	2	3	3
PEO 4	Self-learning capability, leadership qualities with strong communication skills and working in teams.	3	3	2
PEO 5	Capacity to be productive with ethical values, conscious about social and environmental issues with lifelong learning attitude.	3	2	3

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High)

Process for Defining Vision and Mission

The department must establish the Vision and Mission through a consultation process involving the stakeholders of the department, considering the societal requirements. The department's Vision and Mission are framed within the department that are derived from the Institutional Vision and Mission statements. The Programme Assessment Committee (PAC) circulates these statements among the stakeholders of the programme such as Industry, Faculty, Alumni, Parents & Employer and collects the views to refine the draft Vision and Mission statements. These draft statements are forwarded to the Department Academic Committee (DAC) to look into the relevance and consistency with the Vision and Mission of the institute. The DC consolidates these statements and the statements that are presented to the Board of Studies for suggestions. The Academic council will approve the finalized Vision and Mission statements of the department as shown in figure 1. The department takes measures to disseminate these statements among the stakeholders.

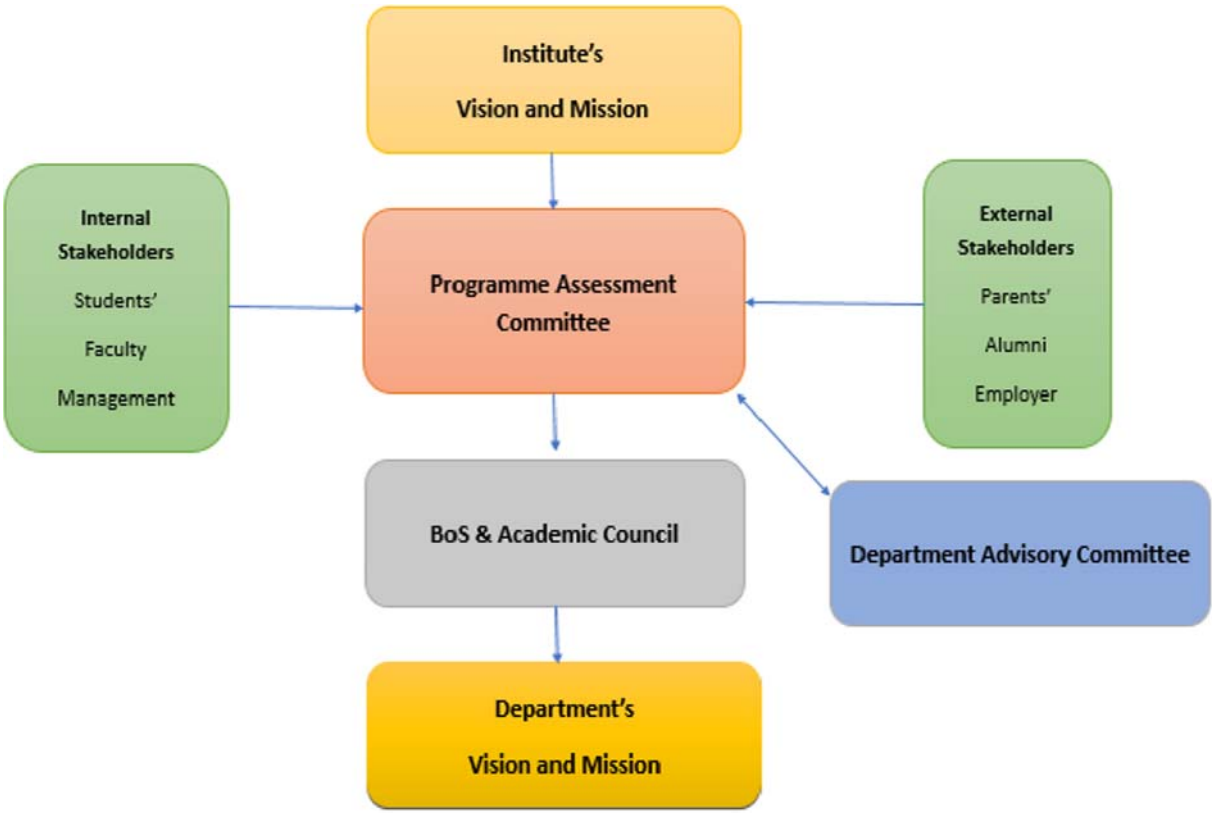

Fig 1: Process of defining Vision and Mission Statements

Process of defining PEOs:

Program Educational Objectives are broad statements that determine what the programme is preparing graduates for their career and professional life. These statements are designed inline with the Vision and Mission statements of the institute, Vision and Mission statements of the department and the Programme Outcomes. Programme outcomes are statements that define what graduates are able to do by the time they graduate. The programme aims at achieving the educational objectives through these Outcomes and the Process of defining PEOs is given in the figure 2.

The programme assessment committee will prepare PEOs by collecting views from the stakeholders such as Faculty, Students, Alumni, Employer and Parents.

The department advisory committee deliberates on the PEOs submitted by the PAC, recommends modifications and forwards the draft PEOs to the BoS for suggestions.

BoS reviews the PEOs and submits its recommendations. The final version of the PEOs are forwarded to the Academic Council by the department for approval.

The approved PEOs are disseminated to all the stakeholders by the department.

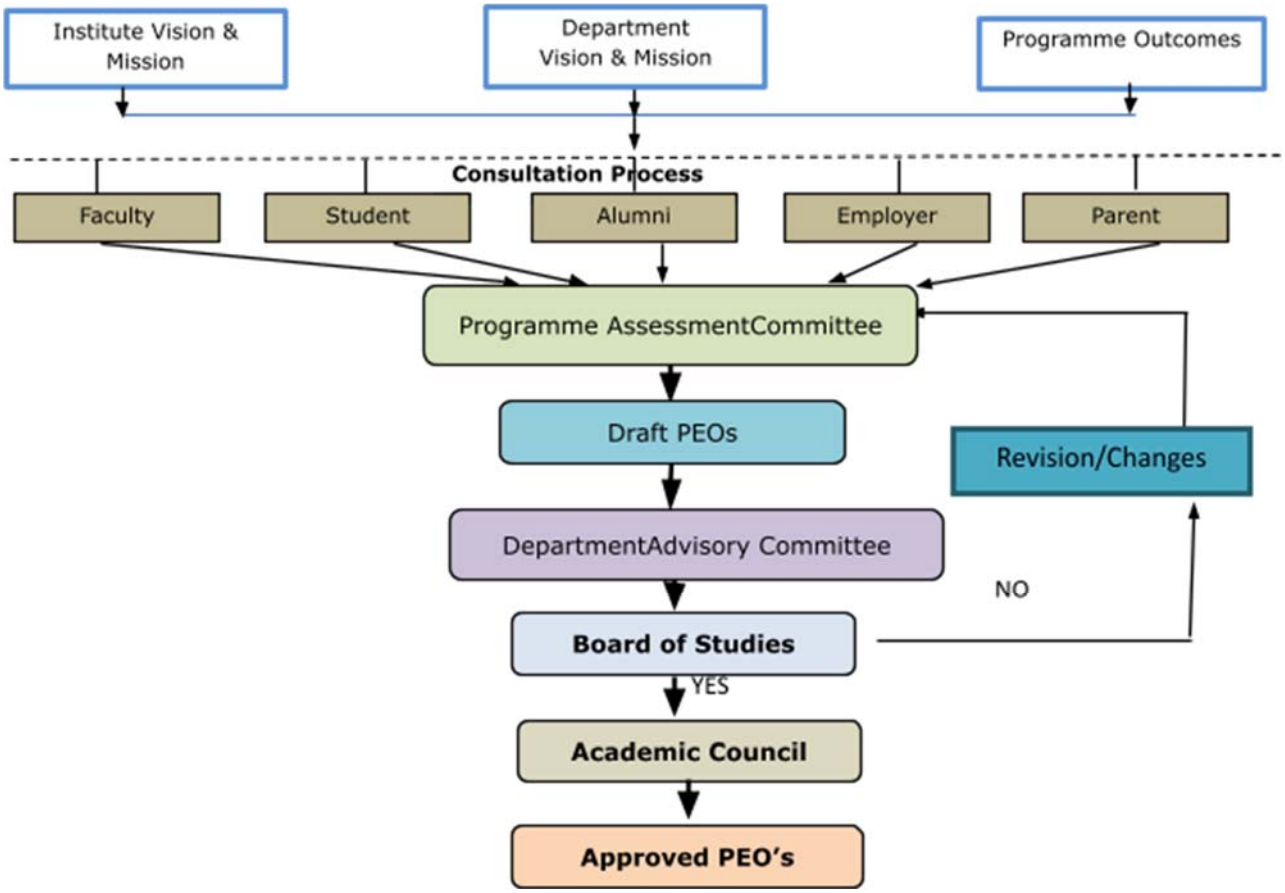

Fig 2: Process of defining PEOs

Course Outcomes

Bloom's Taxonomy:

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes.

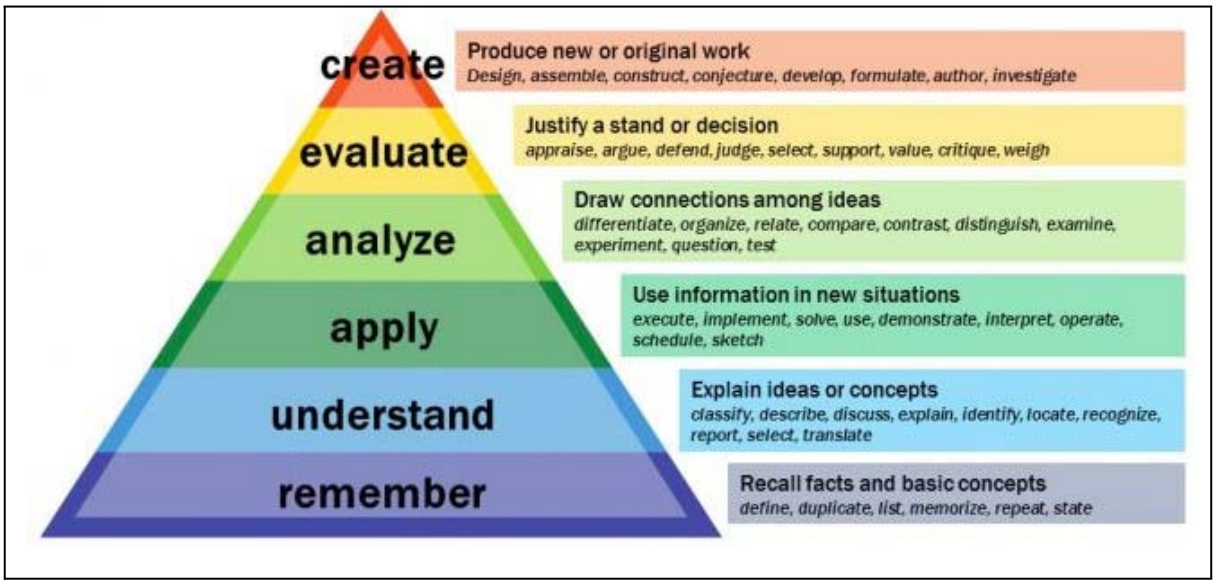

Fig 3: Bloom's Taxonomy

Remembering: the basic recall of information presented through various methods. When we "remember" something, we are able to name it, locate it, define it, etc. We are able to take the content and paint a visual for the learner.

Understanding: the demonstration of what we remember. When we "understand" something, we are able to apply that knowledge in a myriad of ways. We may compute, illustrate, or show others how we interpret that particular concept.

Applying: the solving of problems associated with basic understanding: When we "apply" something, we try to understand its relevance in new situations.

Analyzing: the investigation of the concept for which we previously demonstrated understanding. When we "analyze" something, we break it down so that we can find connections that make the parts a whole.

Evaluating: the process in which the content is examined for validity. When we "evaluate" something, we have to prepare for debate and discussion on prior analysis.

Creating: the development or production of new ideas based on an extensive assessment of a concept. When we "create" something, we are able to build new and interesting phenomena based on the discernment we gained from the previous stages of the model.

Table 1 Revised Bloom's Taxonomy Action Verbs

REVISED Bloom's Taxonomy Action Verbs

Definitions	I. Remembering	II. Understanding	III. Applying	IV. Analyzing	V. Evaluating	VI. Creating
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	• Choose • Define • Find • How • Label • List • Match • Name • Omit • Recall • Relate • Select • Show • Spell • Tell • What • When • Where • Which • Who • Why	• Classify • Compare • Contrast • Demonstrate • Explain • Extend • Illustrate • Infer • Interpret • Outline • Relate • Rephrase • Show • Summarize • Translate	• Apply • Build • Choose • Construct • Develop • Experiment with • Identify • Interview • Make use of • Model • Organize • Plan • Select • Solve • Utilize	• Analyze • Assume • Categorize • Classify • Compare • Conclusion • Contrast • Discover • Dissect • Distinguish • Divide • Examine • Function • Inference • Inspect • List • Motive • Relationships • Simplify • Survey • Take part in • Test for • Theme	• Agree • Appraise • Assess • Award • Choose • Compare • Conclude • Criteria • Criticize • Decide • Deduct • Defend • Determine • Disprove • Estimate • Evaluate • Explain • Importance • Influence • Interpret • Judge • Justify • Mark • Measure • Opinion • Perceive • Prioritize • Prove • Rate • Recommend • Rule on • Select • Support • Value	• Adapt • Build • Change • Choose • Combine • Compile • Compose • Construct • Create • Delete • Design • Develop • Discuss • Elaborate • Estimate • Formulate • Happen • Imagine • Improve • Invent • Make up • Maximize • Minimize • Modify • Original • Originate • Plan • Predict • Propose • Solution • Solve • Suppose • Test • Theory

Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing, Abridged Edition. Boston, MA: Allyn and Bacon.

Course Outcomes: Course Outcomes (COs) are clear statements of what students should be able to demonstrate upon completion of a course. They should be measurable. CO statement should have these three components performance, condition and criteria.

Process of defining Course Outcomes:

The course outcomes of each course are prepared by the course coordinator in consultation with the faculty teaching the same course. The COs must be prepared in accordance with the Bloom's Taxonomy levels. A Course Outcome should Start with an Action verb from Bloom's taxonomy set of verbs. For every course, six COs are drafted in accordance with the Curriculum, they are discussed in the Department Academic Committee and modified based on the suggestions if any. Approval for the COs is obtained from the Board of Studies (BoS).

Sample Course Outcomes:

Basic Electrical Engineering [ES EE101]

Course Outcomes	Details	Action Verb	Knowledge Level
ES-EE101.CO1	To understand and analyze basic electric and magnetic circuits.	understand / analyze	Understand / Analyze
ES-EE101.CO2	To study the working principles of electrical machines and power converters.	study	Remember
ES-EE101.CO3	To introduce the components of low voltage electrical installations.	introduce	Remember
ES-EE101.CO4	To understand the general structure of electrical power system.	understand	Understand
ES-EE101.CO5	To understand the construction and operation of single-phase transformer.	understand	Understand
ES-EE101.CO6	To explain the working principle of power converters.	explain	Understand

CO-PO and CO-PSO Mapping

Correlation Matrices

The COs of every course are published in the syllabus copy, and on the department page of the institute website. The following correlation matrices maintained by every programme in the Outcome Based Education.

1. COs to POs and COs to PSOs: Course outcomes of each course are mapped to the Program Outcomes with a level of correlation value as 3: being highly correlated 2: being medium correlation and 1: being low correlation. Similarly, a correlation table is maintained for COs that have a correlation value to PSOs

2. Course to POs and Course to PSOs: Average of the correlation values of all Course outcomes corresponding to a single PO derives the Course to PO mapping. Similarly, a correlation table is maintained for Course that have an average correlation value to PSOs.

3. Survey questionnaire (SQ) to POs and Survey questionnaire to PSOs: Average of the correlation values (3: being highly correlated 2: being moderate correlation and 1: being low correlation) of all questions corresponding to a single PO derives the SQ to PO mapping. Similarly, a correlation table is maintained for Survey questionnaires that have an average correlation value to PSOs.

4. Program level statistics: For every batch of outgoing students, the programme outcome assessment is measured through the student participation in various co-curricular and extra-curricular activities. Few tools used for measuring include students' participation in workshops/ seminars/ conferences/ paper presentations/ internships/ Guest Lectures etc. are prepared. Each of these activities are mapped to POs and PSOs. Average of the correlation values (3: being highly correlated 2: being moderate correlation and 1: being low correlation) of all questions corresponding to a single PO derives the Program level statistics to PO mapping. Similarly, a correlation table is maintained for Program level statistics that have an average correlation value to PSOs.

Course Articulation Matrix for Basic Electrical Engineering (CO to PO Mapping for BEE)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	2	-	-	-	-	-	-	-
CO2	2	3	3	2	2	-	-	-	-	-	-	-
CO3	2	-	3	1	-	-	-	-	-	-	-	1
CO4	2	-	2	2	3	-	-	-	-	-	-	2
CO5	2	2	-	2	3	-	-	-	-	-	-	1
CO6	2	1	3	3	3	-	-	-	-	-	-	1

Course to PO Mapping for BEE

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
BEE	2.17	2	2.17	2	2.6	-	-	-	-	-	-	1.25

CO to PSO Mapping for BEL

PSO	PSO1	PSO2	PSO3
CO1	1	-	2
CO2	1	-	-
CO3	-	-	3
CO4	-	2	-
CO5	-	-	3
CO6	1	-	-

Course to PSO Mapping for BEE

Course	PSO1	PSO2	PSO3
BEE	1	2	2.67

The Course to PO, Course to PSO mapping must be defined and justification must be included in the course file. The mapping is ratified by the Programme Assessment Committee.

Programme Articulation Matrix (sample)

Program articulation matrix depicts the correlation between all the courses of the programme and Programme Outcomes

Sl	Subject Code	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	CO9	CO10	CO11	CO12
1	BS-CH101	3.0	1.7	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	BS-M102	3.0	2.5	1.3	1.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	2.7
3	ES-EE101	2.17	2.00	2.75	2.00	2.60	0.00	0.00	0.00	0.00	0.00	0.00	1.25
4	BS-CH191	1.0	1.5	1.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	ES-EE191	1.8	2.0	2.5	1.0	2.4	0.0	0.0	0.0	2.4	0.0	0.0	0.0
6	ES-ME191	1.5	1.8	1.3	1.0	0.0	1.0	0.0	0.0	0.0	1.8	0.0	0.0
7	BS-PH201	1.80	2.33	1.83	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	BS-M202	2.8	2.3	2.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.0
9	ES-CS201	2.8	2.3	2.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.0
10	HM-HU201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0	0.0	2.0
11	BS-PH291	1.7	2.5	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	ES-CS291	3.0	3.0	2.0	1.4	3.0	1.6	1.0	1.0	2.3	1.5	2.0	1.4
13	ES-ME292	2.0	2.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0
14	HM-HU291	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
15	PC-EE 301	3.0	2.5	1.7	1.5	2.2	1.5	1.0	1.0	3.0	1.8	2.0	1.3
16	PC-EE 302	3.0	2.8	2.8	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	3.0
17	PC-EE 303	3.0	2.8	2.0	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	ES-ME 301	2.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	1.0
19	BS- M 301	2.8	2.3	2.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.0
20	BS- 301	0.0	1.0	2.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
21	MC-EE 301	0.0	0.0	0.0	3.0	3.0	3.0	0.0	2.0	2.0	2.0	1.0	2.0
22	PC-EE 391	3.0	3.0	2.0	1.4	3.0	1.6	1.0	1.0	2.3	1.5	2.0	1.4
23	PC-EE392	3.0	2.7	2.3	1.3	2.0	0.0	0.0	0.0	0.0	0.0	2.0	1.0
24	PC-CS 391	2.7	2.7	2.0	1.4	3.0	1.6	1.0	1.0	2.3	1.5	2.0	1.4
25	PC-EE-401	2.0	2.3	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0
26	PC-EE 402	2.3	1.8	2.2	2.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
27	PC-EE 403	3.0	2.8	1.7	1.0	1.2	0.0	1.0	0.0	0.0	0.0	0.0	3.0
28	ES-EE 401	3.0	2.8	1.7	1.5	1.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0
29	HM-EE 401	1.7	1.7	2.2	1.7	1.3	2.5	1.8	2.7	1.7	1.2	1.3	1.7
30	PC-EE 491	2.5	2.2	1.7	1.5	2.2	1.5	1.0	1.0	2.8	1.8	2.0	1.3

31	PC-EE 492	1.8	2.3	2.2	1.6	2.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0
32	PC-EE 493	2.7	2.7	2.0	1.4	3.0	1.6	1.0	1.0	2.3	1.5	2.0	1.4
33	ES-ME 491	2.8	2.5	1.8	1.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
34	PC-EE 501	2.0	1.8	1.7	1.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
35	PC-EE 502	2.0	1.8	2.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
36	PC-EE 503	3.0	2.5	2.3	1.8	2.4	2.0	2.0	1.0	2.0	2.3	2.8	2.7
37	PC-EE 504	3.0	2.2	1.8	1.0	1.3	1.0	1.0	0.0	1.8	1.0	0.0	2.2
38	OE-EE-501A	3.0	2.0	1.7	1.3	2.0	2.0	2.0	2.22	2.2	1.8	2.2	2.0
39	PE-EE-501C	3.0	1.8	1.7	2.0	1.0	3.0	3.0	1.0	0.0	0.0	1.8	1.0
40	PC-EE 591	1.8	1.6	1.6	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
41	PC-EE 592	1.5	1.7	1.3	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
42	PC-EE 593	3.0	2.2	1.8	1.0	1.3	1.0	1.0	0.0	1.8	1.0	0.0	2.2
43	PC-EE 594	3.0	2.2	2.8	1.8	2.3	1.0	0.0	0.0	1.8	1.0	1.3	1.0
44	PC-EE-601	1.8	2.7	2.8	1.3	2.5	1.0	2.0	1.0	2.0	0.0	0.0	1.5
45	PC-EE-602	3.0	2.5	2.2	1.5	3.0	1.5	1.5	0.0	1.8	1.8	1.5	1.7
46	PE-EE-601A	3.0	2.7	2.5	2.5	2.4	1.4	1.8	1.0	2.0	2.3	2.7	2.7
47	PE-EE-602A	3.00	2.50	1.67	1.50	2.20	1.50	1.00	1.00	3.00	2.00	2.33	3.00
48	OE-EE-601A	3.0	2.8	2.8	2.5	1.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0
49	HM-EE-601	1.8	2.3	2.2	1.6	2.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0
50	PC-EE 691	2.0	2.0	2.2	1.6	2.0	0.0	0.0	0.0	3.0	0.0	0.0	1.5
51	PC-EE 692	3.0	2.5	2.8	1.8	2.2	1.0	1.0	0.0	1.5	1.0	1.0	1.0
52	PC-EE 681	2.8	2.6	2.0	1.4	0.0	1.5	0.0	0.0	0.0	2.7	0.0	0.0
53	PC-EE 701	3.0	3.0	1.7	1.4	2.5	2.5	1.3	1.0	2.5	2.0	2.0	2.2
54	PE-EE 701C	1.8	2.4	2.8	1.5	2.5	1.0	2.5	1.5	2.5	0.0	0.0	2.3
55	OE-EE-701B	3.0	2.7	1.8	1.8	2.2	2.5	1.7	1.0	2.6	1.6	2.0	2.2
56	OE-EE 702C	3.0	3.0	3.0	2.5	2.8	2.3	2.5	1.8	1.5	2.0	2.0	3.0
57	HM-EE 701	3.0	0.0	1.0	0.0	1.0	2.0	3.0	0.0	1.0	1.8	3.0	0.0
58	PC-EE 791	3.0	3.0	2.0	1.4	3.0	1.6	1.0	1.0	2.3	1.5	3.0	1.4
59	PW-EE 781	2.8	2.7	2.4	1.4	2.3	1.3	1.7	2.0	2.7	3.0	1.5	2.0
60	PW-EE 782	2.8	2.6	2.0	1.4	0.0	1.5	0.0	0.0	0.0	2.7	0.0	0.0
61	PC-EE 801	3.0	2.5	2.0	1.4	3.0	1.6	1.0	1.0	2.3	1.5	2.0	1.4
62	PE- EE 801D	3.0	2.3	1.7	2.0	3.0	1.0	0.0	0.0	1.0	0.0	2.0	0.0
63	OE-EE 801D	2.8	2.6	2.0	1.4	0.0	1.5	0.0	0.0	0.0	2.7	0.0	0.0
64	PW-EE 881	2.3	2.5	2.2	1.8	2.3	1.3	1.7	2.0	2.0	2.3	1.5	2.0

CO Assessment and PO Assessment Tools

CO Assessment Tools:

Various tools used for assessing the attainment of each Course Outcome.

1. Continuous Assessment
    - Presentation
    - Report Writing
    - Class Test
    - Online Quiz
2. Sem-end Examination
3. Rubrics for evaluation of Projects & Project Seminar
4. Course-end survey

Presentation, report writing and examinations contribute to the assessment of students' ability to apply fundamental concepts; quantitative, numerical and analytical skills. Assignments are given frequently to the students, which involve application of concepts for solving a wide range of problems. Each of these assessment tools test the abilities of the students at various cognitive levels as described in Table 1.

Continuous evaluation of Laboratory work contribute towards the assessment of necessary skills to implement ideas and techniques.

Project work evaluation contributes towards the assessment of necessary skills to use modern tools and demonstrate proficiency in the chosen field of interest. Reports, presentation and viva-voce contribute to the assessment of communication skills and dissemination of ideas.

These assessments listed in Table 2 are carried out periodically and hence allow the faculty members to continuously monitor and help the students to attain the course outcomes.

Direct Assessment Tools

- **Presentation** - The assignment is a qualitative performance assessment tool designed to assess students' knowledge of engineering practices, framework, and problem solving at the knowledge, application, and synthesis levels of Bloom's taxonomy. Evaluation will be done by the subject faculty to assess students' knowledge with respect to the learning outcomes associated with the scenario tool.

- **Report Writing** – Report writing is a part of continuous assessment conducted once in a semester that test the students' knowledge in engineering, analytical and problem-solving skills and their capability to provide solutions to engineering problems. Evaluation will be done by the subject faculty to assess students' knowledge with respect to the learning outcomes associated with the scenario tool.
- **Internal Examination** - This type of performance assessment is carried out twice a semester. Every internal exam tests the students' course outcome attainment at all levels of Bloom's Taxonomy such as remembering, understanding, applying, analyzing, evaluating and creating.
- **Semester End Examination** - Semester End examination is a metric for assessing whether all the POs are attained or not. Examination is more focused on attainment of course outcomes and program outcomes using a descriptive exam testing the students at all levels of Bloom's taxonomy.
- **Rubrics** - A rubric explains to students the criteria against which their work will be judged with the "scoring rules". It is used by faculty in assessing the course outcome attainment in projects and seminars during third year and final year. This tool is designed to evaluate the students' capability of self- learning, innovativeness and team management and communication skills. It makes a public key criterion that students can use in developing, reviewing, and judging their own work.

Indirect Assessment Tools

- **Survey reports** - Indirect assessment strategies include Graduate/Exit Survey, Alumni Survey, Employer Survey and Parent Survey. Exit survey is conducted every year for the passing out batches. Alumni Survey is conducted during alumni meets and whenever alumni visit the campus. Employer Survey and Parent Survey are conducted annually.
- **Program level statistics** - For every batch of outgoing students, the programme outcome assessment is measured through the student participation in various co-curricular and extra-curricular activities. Few tools used for measuring include students' participation in workshops/ seminars/ conferences/ paper presentations/ internships/ Guest Lectures etc. are prepared.

Table 2: Tools

Sl. No.	Type of course	Tool	Frequency
1	Theory	CA1: Presentation	Once per semester
		CA2: Report Writing	Once per semester
		CA3: Class Test	Once per semester
		CA4: Online Quiz	Once per semester
		Semester end exam	Once per semester
		Course end survey	Once per semester
2	Laboratories	PCA: Practical Continuous Assessment	Twice per semester
		Semester end exam	Once per semester
		Course end survey	Once per semester
3	Seminar	Rubrics for evaluation of seminar	Once per semester
		Course end survey	Once per semester
4	Projects	Rubrics for evaluation of Projects (Internal)	Once per semester
		Viva-voce (Sem-end exam)	Once per semester
		Course end survey	Once per semester
5	Massive Open Online Courses (MOOCs)	Proctored Exam	Once

Course Outcome (CO) Attainment

PROCESS USED FOR CO ATTAINMENT:

CO Attainment is calculated using the performance of every student through the Continuous Internal Evaluation (which includes Assignments, Quiz and Internal exams) and the Semester end examinations. The below figure 3 shows a flowchart that describes the process used for CO Attainment.

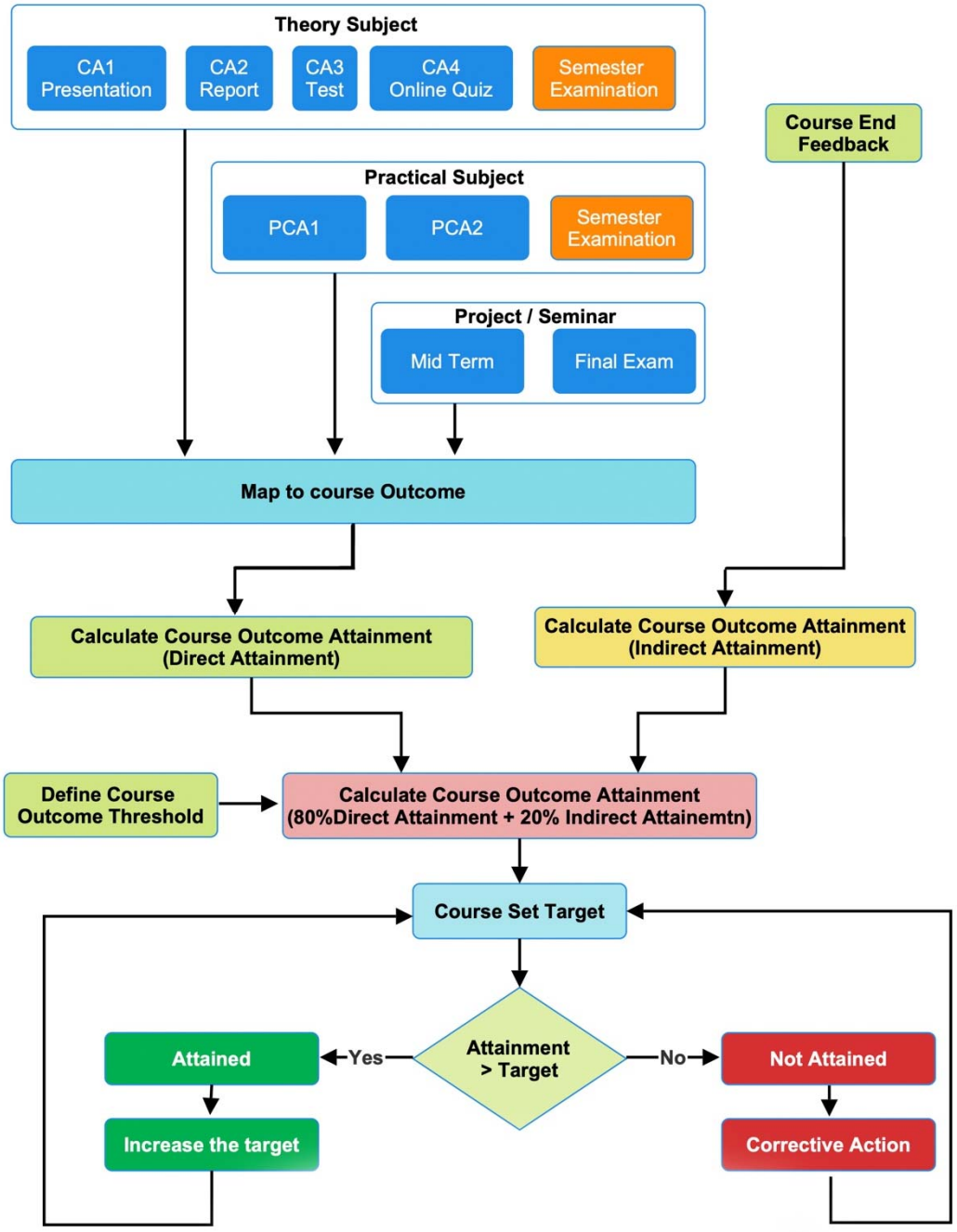

Fig:3 CO Attainment Process

Metrics used for CO Attainment:

The CO Attainment is computed by using the following metrics

Threshold: Is the minimum percentage of marks that students have to score in a course. Eg: The Threshold for the course is set as >=50% marks.

CO Attainment Levels: Every course will have to set the CO Attainment levels using the threshold. Three attainment levels namely Attainment Level 3, Attainment Level 2 & Attainment Level 1 have been identified as shown below, where 3 is the highest and 1 being lowest. Each level is defined as the % of students scoring more than the threshold.

Attainment Level is 3: if >=60% of students scoring >= 60% marks
Attainment Level is 2: if >=50% to <60% of students scoring >= 60% marks
Attainment Level is 1: if >=10% to <50% of students scoring >= 60% marks

All the programmes must maintain only three attainment levels i.e. Attainment Level 3, Attainment Level 2 and Attainment Level 1.

However, there is flexibility given to the Programme Assessment Committee (PAC) in the Department to change the percentage of students in Attainment Levels.

Set Target for the Course: At the beginning of the semester, the course coordinator needs to define Set Target as a baseline for the course, for achieving the CO Attainment.

If the course is attained in the current academic year then the set target for the next academic year may be incremented by a small percentage.

If the Course attainment is less than the Set Target in the current academic year, then the Set Target for the next academic year may be retained or redefined by the course coordinator.

For any new course introduced in the program, the Set Target has to be defined by the course coordinator in consultation with the program coordinator.

CO Attainment procedure

COs are attained through direct and indirect methods.

- Direct Assessment: Assignments, Quizzes, Internal exams and Sem-End Exam question papers are framed to test the students level of understanding of all COs. Each question framed in these assessment

tools are mapped against the course outcomes. Marks obtained by each student for each question in Internal Exam and Sem-End Exam are recorded for outcome analysis. The attainment computation is done by considering the percentage of students scoring more than or equal to the threshold for all the questions that correspond to a particular CO. The calculated average of the CO is compared with the Attainment Levels as described above.

- Indirect Assessment: Course end survey taken at the end of the semester is considered.
- CO Attainment of the course is computed by giving 80% weightage to direct assessment and 20% to indirect assessment.

Sample Direct Attainment Calculation (Theory)

RCC Institute of Information Technology Department of Electrical Engineering Session: 2022-23		
Name of the Faculty: Budhaditya Biswas	**Course Code: PC EE-402**	**Course Name: Digital Electronics**

CO1	**To understand** and **examine** the structure of various number systems and its application in digital design
CO2	The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates
CO3	Ability to **identify** basic requirements for a design application and propose a cost effective solution
CO4	The ability to **apply** memory elements in designing various digital electronics circuits
CO5	To **develop** skill to build, and troubleshoot digital circuits
CO6	Ability to **design** various analog to digital and digital to analog converters

University Roll No		Questions aligned to Course outcomes and marks obtained		Course Outcome Attainment with target in %	
		CO1		**CO1**	**AVG CO**
		Q.1	All Total		
	Distribution of Marks	25	25	70%	**70%**
	Set Target Level	70%			
11701620014	MD. ISFAQUE	25	25	1	**1**
11701621001	Soumyadeep Das	23	23	1	**1**
11701621004	Titli Ghosh	22	22	1	**1**
11701621006	saheb paramanik	23	23	1	**1**

11701621007	Shahobir Alam	24	24	1	1
11701621008	Sayanjit Sengupta	25	25	1	1
11701621009	Afroz Hossain Molla.	25	25	1	1
11701621010	PRABHAT KUMAR	23	23	1	1
11701621011	Arkaprabha Dutta	22	22	1	1
11701621012	Turbasu Roy	23	23	1	1
11701621013	Pritha Dutta	23	23	1	1
11701621014	Antara Dey Sarkar	22	22	1	1
11701621015	AVIK SAMADDER	23	23	1	1
11701621016	Anindita Guha Thakurta	24	24	1	1
11701621018	Md Tofiqul Islam Ansari	25	25	1	1
11701621019	Bikash Dorjee	25	25	1	1
11701621020	Sayan Mondal	23	23	1	1
11701621021	Ayan Dam	22	22	1	1
11701621022	SHINJINEE MONDAL	23	23	1	1
11701621025	Ankur Tikader	23	23	1	1
11701621036	Ankush Paul	22	22	1	1
11701621037	ROHIT ROY	23	23	1	1
11701621038	Manish Biswas	24	24	1	1
11701621039	Suvojit Banerjee	25	25	1	1
11701621040	Souvik Purkait	25	25	1	1
11701621041	Shivam Thakur	23	23	1	1
11701621042	Subhajit Biswas	22	22	1	1
11701621043	Alik Bhattacherjee	23	23	1	1
11701621044	Souvik Dutta	23	23	1	1
11701622018	SAYANTANI DAS	22	22	1	1
11701622019	Anish Paul	23	23	1	1
11701622020	SUBHADIP MONDAL	24	24	1	1
11701622021	DIBYENDU PATRA	22	22	1	1
11701622022	MAYANK MAJUMDER	23	23	1	1
11701622023	BIRJU MAJUMDER	23	23	1	1
11701622024	HILAL UDDIN	22	22	1	1
11701622025	SUBHAJIT BISWAS	23	23	1	1
Total No. of Students Attained COs				37	37

Rationale:
-While setting up the question paper choice was given within the same CO with same complexity/difficulty level and no CO is missed out.
-If the student obtains target set for CO in terms of %age, score of 1 is given and if not zero is given
-Most of the students were found poor in achieving Course outcome two, So remedial classes are subjected to be scheduled.

In Continuous Assessment 1 (Presentation), the topics given to the students is mapped with only one CO (CO1 - To understand and examine the structure of various number systems and its application in digital design). According to the marks obtained by the students it is reflected that total 37 students have attained this CO in CA1 examination. The target label set by the respective faculty members is 70%.

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Department of Electrical Engineering
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Name of the Faculty: Budhaditya Biswas **Course Code:** PC EE-402 **Course Name:** Digital Electronics

CO1	**To understand** and **examine** the structure of various number systems and its application in digital design
CO2	The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates
CO3	Ability to **identify** basic requirements for a design application and propose a cost effective solution
CO4	The ability to **apply** memory elements in designing various digital electronics circuits
CO5	To **develop** skill to build, and troubleshoot digital circuits
CO6	Ability to **design** various analog to digital and digital to analog converters

University Roll No		Questions aligned to Course outcomes and marks obtained		Course Outcome Attainment with target in %	
		CO2		CO2	AVG CO
		Q.1	All Total		
	Distribution of Marks	25	25	70%	70%
	Set Target Level	70%			
11701620014	MD. ISFAQUE	23	23	1	1
11701621001	Soumyadeep Das	24	24	1	1

11701621004	Titli Ghosh	25	25	1	1
11701621006	saheb paramanik	21	21	1	1
11701621007	Shahobir Alam	23	23	1	1
11701621008	Sayanjit Sengupta	22	22	1	1
11701621009	Afroz Hossain Molla.	23	23	1	1
11701621010	PRABHAT KUMAR	20	20	1	1
11701621011	Arkaprabha Dutta	22	22	1	1
11701621012	Turbasu Roy	23	23	1	1
11701621013	Pritha Dutta	24	24	1	1
11701621014	Antara Dey Sarkar	25	25	1	1
11701621015	AVIK SAMADDER	25	25	1	1
11701621016	Anindita Guha Thakurta	23	23	1	1
11701621018	Md Tofiqul Islam Ansari	22	22	1	1
11701621019	Bikash Dorjee	17	17	0	0
11701621020	Sayan Mondal	23	23	1	1
11701621021	Ayan Dam	22	22	1	1
11701621022	SHINJINEE MONDAL	23	23	1	1
11701621025	Ankur Tikader	24	24	1	1
11701621036	Ankush Paul	25	25	1	1
11701621037	ROHIT ROY	25	25	1	1
11701621038	Manish Biswas	23	23	1	1
11701621039	Suvojit Banerjee	22	22	1	1
11701621040	Souvik Purkait	23	23	1	1
11701621041	Shivam Thakur	18	18	1	1
11701621042	Subhajit Biswas	22	22	1	1
11701621043	Alik Bhattacherjee	22	22	1	1
11701621044	Souvik Dutta	23	23	1	1
11701622018	SAYANTANI DAS	24	24	1	1
11701622019	Anish Paul	25	25	1	1
11701622020	SUBHADIP MONDAL	20	20	1	1
11701622021	DIBYENDU PATRA	23	23	1	1
11701622022	MAYANK MAJUMDER	22	22	1	1
11701622023	BIRJU MAJUMDER	17	17	0	0
11701622024	HILAL UDDIN	23	23	1	1
11701622025	SUBHAJIT BISWAS	24	24	1	1
Total No. of Students Attained COs				35	35

In Continuous Assessment 2 (Report Writing), the topics given to the students is mapped with only one CO (CO2 - The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates). According to the marks obtained by the students it is reflected that total 36 students have attained this CO in CA2 examination. The target label set by the respective faculty members is 70%.

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CO1	**To understand** and **examine** the structure of various number systems and its application in digital design
CO2	The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates
CO3	Ability to **identify** basic requirements for a design application and propose a cost effective solution
CO4	The ability to **apply** memory elements in designing various digital electronics circuits
CO5	To **develop** skill to build, and troubleshoot digital circuits
CO6	Ability to **design** various analog to digital and digital to analog converters

University Roll no		Questions aligned to Course outcomes and marks obtained									Course Outcome Attainment with target in %			
		CO3			CO4			CO5						
		Q. 1	Q. 2	Total	Q. 3	Q. 4	Total	Q. 5	Total	Total Marks	**CO 3**	**CO 4**	**CO 5**	**AVG CO**
	Distribution of Marks	5	4	9	5	5	10	6	6	25	75 %	75 %	75 %	**75 %**
	Set Target Level	75%			75%			75%						
11701620014	MD. ISFAQUE	4	3	7	4	3	7	5	5	19	1	0	1	**2**
11701621001	Soumyadeep Das	2	4	6	4	5	9	5	5	20	0	1	1	**2**
11701621004	Titli Ghosh	3	2	5	5	5	10	5	5	20	0	1	1	**2**
11701621006	saheb paramanik	5	3	8	4	3	7	5	5	20	1	0	1	**2**

11701621007	Shahobir Alam	5	4	9	5	4	9	6	6	24	1	1	1	3
11701621008	Sayanjit Sengupta	3	3	6	5	4	9	5	5	20	0	1	1	2
11701621009	Afroz Hossain Molla.	4	4	8	4	5	9	2	2	19	1	1	0	2
11701621010	PRABHAT KUMAR	4	2	6	5	4	9	5	5	20	0	1	1	2
11701621011	Arkaprabha Dutta	5	3	8	3	5	8	5	5	21	1	1	1	3
11701621012	Turbasu Roy	4	4	8	4	3	7	5	5	20	1	0	1	2
11701621013	Pritha Dutta	5	3	8	4	5	9	5	5	22	1	1	1	3
11701621014	Antara Dey Sarkar	3	2	5	2	5	7	5	5	17	0	0	1	1
11701621015	AVIK SAMADDER	4	3	7	3	3	6	5	5	18	1	0	1	2
11701621016	Anindita Guha Thakurta	5	4	9	5	4	9	5	5	23	1	1	1	3
11701621018	Md Tofiqul Islam Ansari	3	3	6	5	4	9	5	5	20	0	1	1	2
11701621019	Bikash Dorjee	4	4	8	3	5	8	5	5	21	1	1	1	3
11701621020	Sayan Mondal	4	2	6	4	4	8	3	6	20	0	1	1	2
11701621021	Ayan Dam	2	3	5	4	5	9	5	5	19	0	1	1	2
11701621022	SHINJINEE MONDAL	3	4	7	5	4	9	5	5	21	1	1	1	3
11701621025	Ankur Tikader	5	3	8	4	4	8	5	5	21	1	1	1	3
11701621036	Ankush Paul	5	3	8	5	5	10	5	5	23	1	1	1	3
11701621037	ROHIT ROY	3	4	7	3	4	7	5	5	19	1	0	1	2
11701621038	Manish Biswas	4	3	7	5	5	10	5	5	22	1	1	1	3
11701621039	Suvojit Banerjee	4	4	8	5	4	9	4	4	21	1	1	0	2
11701621040	Souvik Purkait	5	2	7	3	4	7	5	5	19	1	0	1	2
11701621041	Shivam Thakur	4	3	7	4	5	9	4	4	20	1	1	0	2
11701621042	Subhajit Biswas	5	4	9	4	4	8	5	5	22	1	1	1	3
11701621043	Alik Bhattacherjee	3	3	6	5	5	10	5	5	21	0	1	1	2
11701621044	Souvik Dutta	4	2	6	4	3	7	5	5	18	0	0	1	1
11701622018	SAYANTANI DAS	5	3	8	5	5	10	5	5	23	1	1	1	3
11701622019	Anish Paul	3	4	7	4	5	9	5	5	21	1	1	1	3
11701622020	SUBHADIP MONDAL	4	3	7	4	3	7	4	4	18	1	0	0	1

11701622021	DIBYENDU PATRA	4	4	8	5	4	9	5	5	22	1	1	1	3
11701622022	MAYANK MAJUMDER	4	2	6	4	4	8	4	4	18	0	1	0	1
11701622023	BIRJU MAJUMDER	5	3	8	5	5	10	5	5	23	1	1	1	3
11701622024	HILAL UDDIN	4	2	6	3	4	7	4	4	17	0	0	0	0
11701622025	SUBHAJIT BISWAS	5	3	8	5	4	9	2	2	19	1	1	0	2
Total No. of Students Attained COs		3.9	3.1		4.2	4.2		4.7			25	27	30	82

Rationale:
-While setting up the assignments, questions were aligned to Cos.
-One CO could be covered with more than one Assignment depending on the significance. Therefore, more number of assignments are given during semester and evaluation done according to above system.

In Continuous Assessment 3 (Written Test), the questions given to the students is mapped with three COs (CO3 - Ability to **identify** basic requirements for a design application and propose a cost-effective solution, CO4 - The ability to **apply** memory elements in designing various digital electronics circuits and CO5 - To **develop** skill to build, and troubleshoot digital circuits). According to the marks obtained by the students it is reflected that total **25** students have attained the CO3, **27** students have attained the CO4 and **30** students have attained the CO5 in CA3 examination. The target label set by the respective faculty members is CO3 - 75%, CO4 - 75% and CO5 - 75%.

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CO2	The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates
CO3	Ability to **identify** basic requirements for a design application and propose a cost effective solution
CO4	The ability to **apply** memory elements in designing various digital electronics circuits
CO5	To **develop** skill to build, and troubleshoot digital circuits
CO6	Ability to **design** various analog to digital and digital to analog converters

S. No.		Questions aligned to Course outcomes and marks obtained													Course Outcome Attainment with target in %						
		CO1		CO2		CO3		CO4		CO5		CO6									
		Q.1	Total	Q.2	Total	Q.3	Total	Q.4	Total	Q.5	Total	Q.6	Total	Total Marks	CO1	CO2	CO3	CO4	CO5	CO6	AVGCO
	Distribution of Marks	4	4	4	4	4	4	4	4	4	4	5	5	25	75%	75%	75%	75%	75%	75%	75%
	Set Target Level	75%		75%		75%		75%		75%		75%									
11701620014	MD. ISFAQUE	3	3	4	4	4	4	4	4	4	4	4	4	23	1	1	1	1	1	1	6
11701621001	Soumyadeep Das	2	2	3	3	3	3	3	3	4	4	5	5	20	0	1	1	1	1	1	5
11701621004	Titli Ghosh	3	3	2	2	4	4	3	3	4	4	4	4	20	1	0	1	1	1	1	5
11701621006	saheb paramanik	2	2	3	3	3	3	4	4	4	4	5	5	21	0	1	1	1	1	1	5
11701621007	Shahobir Alam	4	4	4	4	3	3	4	4	2	2	2	2	19	1	1	1	1	0	0	4
11701621008	Sayanjit Sengupta	3	3	3	3	4	4	3	3	4	4	4	4	21	1	1	1	1	1	1	6
11701621009	Afroz Hossain Molla.	4	4	4	4	4	4	4	4	4	4	4	4	24	1	1	1	1	1	1	6
11701621010	PRABHAT KUMAR	3	3	4	4	4	4	4	4	4	4	4	4	23	1	1	1	1	1	1	6
11701621011	Arkaprabha Dutta	2	2	3	3	3	3	4	4	3	3	5	5	20	0	1	1	1	1	1	5
11701621012	Turbasu Roy	4	4	4	4	4	4	4	4	4	4	4	4	24	1	1	1	1	1	1	6
11701621013	Pritha Dutta	2	2	4	4	3	3	4	4	4	4	4	4	21	0	1	1	1	1	1	5
11701621014	Antara Dey Sarkar	3	3	3	3	4	4	4	4	3	3	3	3	20	1	1	1	1	1	0	5

11701621015	AVIK SAMADDER	4	4	2	2	3	3	2	2	4	4	4	4	19	1	0	1	0	1	1	4
11701621016	Anindita Guha Thakurta	3	3	4	4	4	4	3	3	4	4	5	5	23	1	1	1	1	1	1	6
11701621018	Md Tofiqul Islam Ansari	4	4	4	4	4	4	4	4	4	4	4	4	24	1	1	1	1	1	1	6
11701621019	Bikash Dorjee	3	3	2	2	4	4	4	4	4	4	5	5	22	1	0	1	1	1	1	5
11701621020	Sayan Mondal	3	3	4	4	4	4	4	4	4	4	4	4	23	1	1	1	1	1	1	6
11701621021	Ayan Dam	4	4	4	4	4	4	3	3	4	4	5	5	24	1	1	1	1	1	1	6
11701621022	SHINJINEE MONDAL	3	3	4	4	4	4	4	4	2	2	4	4	21	1	1	1	1	0	1	5
11701621025	Ankur Tikader	3	3	3	3	3	3	4	4	3	3	4	4	20	1	1	1	1	1	1	6
11701621036	Ankush Paul	2	2	4	4	4	4	4	4	4	4	4	4	22	0	1	1	1	1	1	5
11701621037	ROHIT ROY	4	4	4	4	4	4	3	3	4	4	5	5	24	1	1	1	1	1	1	6
11701621038	Manish Biswas	2	2	4	4	4	4	4	4	4	4	4	4	22	0	1	1	1	1	1	5
11701621039	Suvojit Banerjee	4	4	2	2	4	4	3	3	3	3	4	4	20	1	0	1	1	1	1	5
11701621040	Souvik Purkait	2	2	4	4	4	4	4	4	4	4	4	4	22	0	1	1	1	1	1	5
11701621041	Shivam Thakur	3	3	2	2	4	4	4	4	4	4	5	5	22	1	0	1	1	1	1	5
11701621042	Subhajit Biswas	2	2	3	3	3	3	3	3	4	4	4	4	19	0	1	1	1	1	1	5
11701621043	Alik Bhattacherjee	3	3	4	4	4	4	4	4	4	4	4	4	23	1	1	1	1	1	1	6
11701621044	Souvik Dutta	2	2	2	2	4	4	4	4	3	3	4	4	19	0	0	1	1	1	1	4
11701622018	SAYANTANI DAS	3	3	4	4	4	4	4	4	4	4	5	5	24	1	1	1	1	1	1	6

11701622019	Anish Paul	4	4	4	4	3	3	4	4	4	4	4	4	23	1	1	1	1	1	1	6
11701622020	SUBHADIP MONDAL	2	2	4	4	4	4	3	3	2	2	4	4	19	0	1	1	1	0	1	4
11701622021	DIBYENDU PATRA	4	4	4	4	4	4	4	4	4	4	4	4	24	1	1	1	1	1	1	6
11701622022	MAYANK MAJUMDER	2	2	4	4	4	4	3	3	4	4	5	5	22	0	1	1	1	1	1	5
11701622023	BIRJU MAJUMDER	3	3	4	4	4	4	4	4	4	4	4	4	23	1	1	1	1	1	1	6
11701622024	HILAL UDDIN	2	2	4	4	4	4	3	3	4	4	5	5	22	0	1	1	1	1	1	5
11701622025	SUBHAJIT BISWAS	3	3	4	4	4	4	4	4	4	4	4	4	23	1	1	1	1	1	1	6
Total No. of Students Attained COs		**2.9**		**3.5**		**3.8**		**3.6**		**3.7**		**4.2**			**19**	**24**	**29**	**28**	**27**	**28**	**83**

Rationale:
-While setting up the assignments, questions were aligned to Cos.
-One CO could be covered with more than one Assignment depending on the significance. Therefore, more number of assignments are given during semester and evaluation done according to above system.
-If the student obtains target set for CO in terms of %age, score of 1 is given and if not zero is given

In Continuous Assessment 4 (Online MCQ), the questions given to the students is mapped with all COs (CO1 - **To understand** and **examine** the structure of various number systems and its application in digital design, CO2 - The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates, CO3 - Ability to **identify** basic requirements for a design application and propose a cost effective solution, CO4 - The ability to **apply** memory elements in designing various digital electronics circuits, CO5 - To **develop** skill to build, and troubleshoot digital circuits and CO6 - Ability to **design** various analog to digital and digital to analog converters). According to the marks obtained by the students it is reflected that total

19 students have attained the CO1
24 students have attained the CO2
29 students have attained the CO3
28 students have attained the CO4
27 students have attained the CO5
28 students have attained the CO6

in CA3 examination. The target label set by the respective faculty members is CO1 - 75%, CO2 - 75%, CO3 - 75%, CO4 - 75%, CO5 - 75% and CO3 - 75%.

University Semester Examination

RCC Institute of Information Technology Department of Electrical Engineering Session: 2022-23		
Name of the Faculty: Budhaditya Biswas	**Course Code:** PC EE-402	**Course Name:** Digital Electronics

CO1	**To understand** and **examine** the structure of various number systems and its application in digital design
CO2	The **ability** to **understand**, **analyze** and **design** various combinational and sequential circuits using basic gates
CO3	Ability to **identify** basic requirements for a design application and propose a cost effective solution
CO4	The ability to **apply** memory elements in designing various digital electronics circuits
CO5	To **develop** skill to build, and troubleshoot digital circuits
CO6	Ability to **design** various analog to digital and digital to analog converters

Class Roll No		Marks obtained	Attainment
	Maximum Marks	70.00	52.5
	Set Target Level	75%	
11701620014	MD. ISFAQUE	63	1
11701621001	Soumyadeep Das	61	1
11701621004	Titli Ghosh	65	1
11701621006	saheb paramanik	43	0
11701621007	Shahobir Alam	61	1
11701621008	Sayanjit Sengupta	54	1
11701621009	Afroz Hossain Molla.	64	1
11701621010	PRABHAT KUMAR	45	0
11701621011	Arkaprabha Dutta	63	1
11701621012	Turbasu Roy	61	1
11701621013	Pritha Dutta	44	0

11701621014	Antara Dey Sarkar	64	1
11701621015	AVIK SAMADDER	55	1
11701621016	Anindita Guha Thakurta	63	1
11701621018	Md Tofiqul Islam Ansari	65	1
11701621019	Bikash Dorjee	63	1
11701621020	Sayan Mondal	41	0
11701621021	Ayan Dam	54	1
11701621022	SHINJINEE MONDAL	64	1
11701621025	Ankur Tikader	65	1
11701621036	Ankush Paul	53	1
11701621037	ROHIT ROY	37	0
11701621038	Manish Biswas	54	1
11701621039	Suvojit Banerjee	64	1
11701621040	Souvik Purkait	65	1
11701621041	Shivam Thakur	53	1
11701621042	Subhajit Biswas	61	1
11701621043	Alik Bhattacherjee	64	1
11701621044	Souvik Dutta	64	1
11701622018	SAYANTANI DAS	55	1
11701622019	Anish Paul	63	1
11701622020	SUBHADIP MONDAL	65	1
11701622021	DIBYENDU PATRA	63	1
11701622022	MAYANK MAJUMDER	43	0
11701622023	BIRJU MAJUMDER	55	1
11701622024	HILAL UDDIN	44	0
11701622025	SUBHAJIT BISWAS	44	0
Total No. of Students		37	29
Percentage of students who attained target		78%	

From the analysis it is reflected that total 29 student have attended the criteria. Here the target label set by the respective faculty is 70%.

Overall CO Attainment

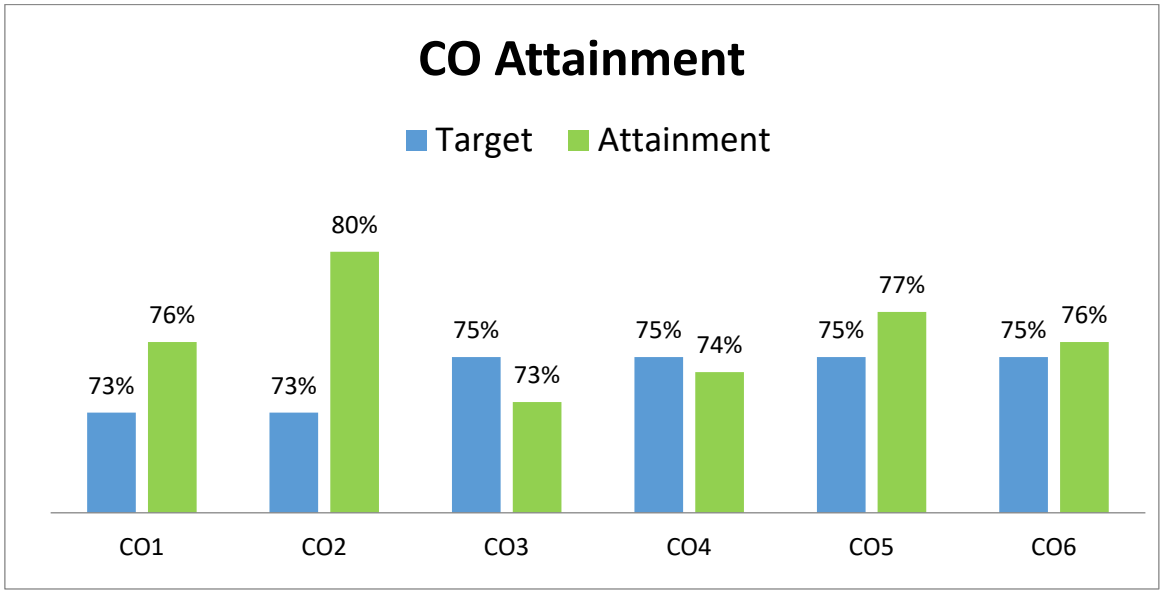
RCC Institute of Information Technology
Course Outcome Attainment
Name of the Faculty: Budhaditya Biswas
Course Code: PC EE-402
Course Name: Digital Electronics
Session: 2022 - 23

As per NBA SAR 3.3.1 : Record of Assessement Carried from different Sheets									
Total No of Students in the Class:			37						
S.No.	Exam	CO 1	CO 2	CO 3	CO 4	CO5	CO6	Target	Overall Achievement
1	CA 1 (Presentation)	37	0	0	0	0	0	70%	12
2	CA 2 (Report)	0	35	0	0	0	0	70%	12
3	CA3 (Written)	0	0	25	27	30	0	75%	19
4	CA 4 (MCQ)	19	24	29	28	27	28	75%	28
	Average Internals	28	30	27	28	29	28	73%	28

Record of Assessement Through Internals					
Course Outcome	Target Course Outcome%	TOTAL STUDENTS	TOTAL STUDENT WHO ATTAINED OUTCOME	% STUDENTS WHO ATTAINED THE OUTCOME	Attainment Level of Each Course Outcome
CO1	73%	37	28	76%	2
CO2	73%	37	30	80%	2
CO3	75%	37	27	73%	2
CO4	75%	37	28	74%	2
CO5	75%	37	29	77%	2
CO6	75%	37	28	76%	2
CO	74%	37	28	75.90%	2

As per NBA SAR Example given in 3.2.2: Record of Attainment Level of A Course through University and Internal Assessments						
	Target Course Outcome%	TOTAL STUDENTS	TOTAL STUDENT WHO ATTAINED OUTCOME		% STUDENTS WHO ATTAINED THE OUTCOME	Attainment Level
Internals	74%	37	28		76%	2
University	75%	37	29		78%	2
Overall Attainment of Course Outcome=70% University +30% Internals						2

Here all the COs are calculated from CA-1 to CA-4 and university examination. The weightage given here is continuous assessment 30% and semester examination 70%. After calculation all the CO it is coming that in this subject the CO attainment is at level 2.



PO Attainment

RCC Institute of Information Technology
Program Outcome Attainment
Name of the Faculty: Budhaditya Biswas
Course Code: PC EE-402
Course Name: Digital Electronics
Session: 2022 - 23

As per NBA SAR 3.1.2: MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES USING 1,2,3

Total No of Students: 37

S.No.	CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
1	CO1	2	-	2	1	-	-	3	-	1	-	-	-	2	-	2
2	CO2	1	2	3	1	2	2	-	-	-	2	3	-	1	-	2
3	CO3	1	2	2	3	1	-	2	-	2	-	-	-	2	-	3
4	CO4	-	1	2	2	1	-	-	2	-	-	2	1	-	2	-
5	CO5	1	2		1	2	2	-	3	3	1	-	1	1	1	3
6	CO6	-	-	1	-	1	-	-	2-	-	2	-	3	1	2	2
AVERAGE		1.25	1.75	2.00	1.60	1.40	1	2.5	2.33	2	1.67	2.5	1.00	1.40	1.67	2.40

As per NBA SAR 3.3.2 RECORD OF ATTAINMENT OF COURSE OUTCOMES WITH PROGRAM OUTCOMES																
S.No.	Exam	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
Direct Attainment		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Indirect Attainment		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Attainment		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Final Attainment		1.85	1.4	1.8	1.8	1.6	1.2	1.6	1.2	0.8	1.6	1.2	1.4	1.15	1.37	1.97

Here the direct attainment is coming from the direct attachment tab and the indirect attainment is coming from the course feedback by the student at the end of the semester. The overall attainment is calculated taking 90% of the direct attainment and 10% of the indirect attachment. The final attainment is calculated by multiplying the average of CO-PO mapping multiplying by final attainment by 3.

Sample Direct Attainment Calculation (Laboratory)

RCC Institute of Information Technology Department of Engineering Science & Management Session: 2022-23		
Name of the Faculty: Avijit Saha	**Course Code:** ES ME-491	**Course Name:** Thermal Power Engineering Lab

CO1	**Demonstrate** the basic working principle of boilers and IC engine through cut model.
CO2	**Analyze** the 4 Stroke Petrol Engine & Diesel Engine and their performance parameters by Rope Brake Dynamometer & Electrical Load Box
CO3	**Compare** the heat balance at 4 stroke diesel engine for load applied by Rope Brake Dynamometer or Electrical Load Box.
CO4	**Construct** Valve Timing Diagram through the cut model of 4S Diesel Engine Model & 4S Petrol Engine.
CO5	**Distinguish** various characteristics of Petrol and Diesel fuel.
CO6	**Determine** the quality of steam like enthalpy, dryness fraction through experiment.

PCA1

University Roll No.		Questions aligned to Course outcomes and marks obtained									Course Outcome Attainment with target in %			
		CO1			CO2			CO3			CO 1	CO 2	CO 3	AVG CO
		Q. 1	Q. 2	Total	Q. 3	Q. 4	Total	Q. 5	Total	All Total				
	Distribution of Marks	8	8	16	8	8	16	8	8	40	75 %	75 %	75 %	75 %
	Set Target Level	75%			75%			75%						
11701620014	MD. ISFAQUE	7	6	13	6	7	13	6	6	32	1	1	1	3
11701621001	Soumyadeep Das	6	7	13	7	6	13	7	7	33	1	1	1	3
11701621004	Titli Ghosh	7	6	13	8	6	14	6	6	33	1	1	1	3
11701621006	saheb paramanik	6	5	11	7	6	13	7	7	31	0	1	1	2
11701621007	Shahobir Alam	7	7	14	6	7	13	6	6	33	1	1	1	3
11701621008	Sayanjit Sengupta	6	7	13	5	6	11	8	8	32	1	0	1	2
11701621009	Afroz Hossain Molla.	8	8	16	6	8	14	7	7	37	1	1	1	3
11701621010	PRABHAT KUMAR	7	7	14	7	7	14	7	7	35	1	1	1	3
11701621011	Arkaprabha Dutta	5	6	11	6	7	13	6	6	30	0	1	1	2
11701621012	Turbasu Roy	8	8	16	8	6	14	8	8	38	1	1	1	3
11701621013	Pritha Dutta	7	7	14	7	8	15	7	7	36	1	1	1	3
11701621014	Antara Dey Sarkar	8	5	13	7	7	14	5	5	32	1	1	0	2
11701621015	AVIK SAMADDER	6	8	14	6	5	11	8	8	33	1	0	1	2
11701621016	Anindita Guha Thakurta	7	7	14	8	8	16	7	7	37	1	1	1	3
11701621018	Md Tofiqul Islam Ansari	8	8	16	7	7	14	8	8	38	1	1	1	3
11701621019	Bikash Dorjee	7	6	13	5	8	13	6	6	32	1	1	1	3
11701621020	Sayan Mondal	6	7	13	6	5	11	7	7	31	1	0	1	2
11701621021	Ayan Dam	5	8	13	7	7	14	8	8	35	1	1	1	3
11701621022	SHINJINEE MONDAL	6	7	13	8	8	16	7	7	36	1	1	1	3
11701621025	Ankur Tikader	7	6	13	6	7	13	6	6	32	1	1	1	3
11701621036	Ankush Paul	6	5	11	7	6	13	7	7	31	0	1	1	2
11701621037	ROHIT ROY	8	6	14	8	6	14	6	6	34	1	1	1	3

1170162 1038	Manish Biswas	7	7	14	7	7	14	5	5	33	1	1	0	2
1170162 1039	Suvojit Banerjee	7	6	13	6	8	14	6	6	33	1	1	1	3
1170162 1040	Souvik Purkait	6	8	14	5	7	12	8	8	34	1	1	1	3
1170162 1041	Shivam Thakur	8	7	15	6	6	12	7	7	34	1	1	1	3
1170162 1042	Subhajit Biswas	7	7	14	4	5	9	7	7	30	1	0	1	2
1170162 1043	Alik Bhattacherjee	6	6	12	6	6	12	6	6	30	1	1	1	3
1170162 1044	Souvik Dutta	8	8	16	8	7	15	8	8	39	1	1	1	3
1170162 2018	SAYANTANI DAS	7	7	14	7	6	13	7	7	34	1	1	1	3
1170162 2019	Anish Paul	6	5	11	7	8	15	7	7	33	0	1	1	2
1170162 2020	SUBHADIP MONDAL	6	8	14	6	7	13	8	8	35	1	1	1	3
1170162 2021	DIBYENDU PATRA	7	4	11	8	7	15	7	7	33	0	1	1	2
1170162 2022	MAYANK MAJUMDER	8	8	16	7	6	13	8	8	37	1	1	1	3
1170162 2023	BIRJU MAJUMDER	7	6	13	5	8	13	5	5	31	1	1	0	2
1170162 2024	HILAL UDDIN	6	7	13	8	4	12	7	7	32	1	1	1	3
1170162 2025	SUBHAJIT BISWAS	5	8	13	7	5	12	8	8	33	1	1	1	3
Total No. of Students Attained COs		6.7	6.7		6.6	6.6		6.9	6.9		32	33	34	99

Rationale:
-While setting up the question paper choice was given within the same CO with same complexity/difficulty level and no CO is missed out.
-If the student obtains target set for CO in terms of %age, score of 1 is given and if not zero is given
-Most of the students were found poor in achieving Course outcome two, So remedial classes are subjected to be scheduled.

PCA2

University Roll No		CO4			CO5			CO6			CO 4	CO 5	CO 6	AVG CO
		Q. 1	Q. 2	Total	Q. 3	Q. 4	Total	Q. 5	Total	All Total				
	Distribution of Marks	8	8	16	8	8	16	8	8	40	75 %	75 %	75 %	75 %
	Set Target Level	75%			75%			75%						

11701620014	MD. ISFAQUE	5	8	13	6	6	12	6	6	31	1	1	1	3
11701621001	Soumyadeep Das	6	7	13	7	7	14	8	8	35	1	1	1	3
11701621004	Titli Ghosh	7	7	14	8	6	14	8	8	36	1	1	1	3
11701621006	saheb paramanik	6	6	12	6	7	13	5	5	30	1	1	0	2
11701621007	Shahobir Alam	8	8	16	7	7	14	8	8	38	1	1	1	3
11701621008	Sayanjit Sengupta	7	7	14	6	7	13	7	7	34	1	1	1	3
11701621009	Afroz Hossain Molla.	7	5	12	7	6	13	7	7	32	1	1	1	3
11701621010	PRABHAT KUMAR	6	6	12	5	6	11	6	6	29	1	0	1	2
11701621011	Arkaprabha Dutta	8	7	15	8	7	15	7	7	37	1	1	1	3
11701621012	Turbasu Roy	7	6	13	7	7	14	8	8	35	1	1	1	3
11701621013	Pritha Dutta	5	8	13	7	6	13	7	7	33	1	1	1	3
11701621014	Antara Dey Sarkar	6	5	11	6	8	14	6	6	31	0	1	1	2
11701621015	AVIK SAMADDER	7	6	13	8	7	15	5	5	33	1	1	0	2
11701621016	Anindita Guha Thakurta	8	7	15	7	5	12	6	6	33	1	1	1	3
11701621018	Md Tofiqul Islam Ansari	6	6	12	6	4	10	7	7	29	1	0	1	2
11701621019	Bikash Dorjee	7	8	15	8	5	13	6	6	34	1	1	1	3
11701621020	Sayan Mondal	8	7	15	7	8	15	8	8	38	1	1	1	3
11701621021	Ayan Dam	7	7	14	5	7	12	7	7	33	1	1	1	3
11701621022	SHINJINEE MONDAL	6	6	12	8	8	16	7	7	35	1	1	1	3
11701621025	Ankur Tikader	6	8	14	7	6	13	8	8	35	1	1	1	3
11701621036	Ankush Paul	7	6	13	8	7	15	7	7	35	1	1	1	3
11701621037	ROHIT ROY	8	8	16	6	8	14	7	7	37	1	1	1	3
11701621038	Manish Biswas	7	7	14	6	8	14	6	6	34	1	1	1	3
11701621039	Suvojit Banerjee	6	7	13	7	7	14	8	8	35	1	1	1	3
11701621040	Souvik Purkait	7	6	13	6	7	13	7	7	33	1	1	1	3
11701621041	Shivam Thakur	6	8	14	8	6	14	5	5	33	1	1	0	2
11701621042	Subhajit Biswas	7	7	14	7	8	15	7	7	36	1	1	1	3

11701621043	Alik Bhattacherjee	6	5	11	7	7	14	8	8	33	0	1	1	2
11701621044	Souvik Dutta	8	7	15	6	5	11	6	6	32	1	0	1	2
11701622018	SAYANTANI DAS	7	6	13	8	7	15	7	7	35	1	1	1	3
11701622019	Anish Paul	7	8	15	7	7	14	8	8	37	1	1	1	3
11701622020	SUBHADIP MONDAL	6	7	13	6	6	12	7	7	32	1	1	1	3
11701622021	DIBYENDU PATRA	8	6	14	7	4	11	6	6	31	1	0	1	2
11701622022	MAYANK MAJUMDER	4	8	12	6	7	13	7	7	32	1	1	1	3
11701622023	BIRJU MAJUMDER	5	7	12	8	7	15	6	6	33	1	1	1	3
11701622024	HILAL UDDIN	8	5	13	7	8	15	8	8	36	1	1	1	3
11701622025	SUBHAJIT BISWAS	7	8	15	7	6	13	7	7	35	1	1	1	3
Total No. of Students Attained COs		6.7	6.8		6.8	6.6		6.9			27	26	27	80

Rationale:
-While setting up the assignments, questions were aligned to Cos.
-One CO could be covered with more than one Assignment depending on the significance. Therefore, more number of assignments are given during semester and evaluation done according to above system.
-If the student obtains target set for CO in terms of %age, score of 1 is given and if not zero is given

University Exam

University Roll No.		All Cos	All Cos	All Cos		All COs	All COs	All COs
		Viva	Report	Conduct	All Total	Viva	Report	Conduct
	Maximum Marks	20	15	25	60	15	11.25	18.75
	Set Target Level	75%	75%	75%	75%			
11701620014	MD. ISFAQUE	17	13	23	53	1	1	1
11701621001	Soumyadeep Das	18	14	22	54	1	1	1
11701621004	Titli Ghosh	17	13	25	55	1	1	1
11701621006	saheb paramanik	14	14	21	49	0	1	1
11701621007	Shahobir Alam	16	11	20	47	1	1	1
11701621008	Sayanjit Sengupta	19	13	18	50	1	1	1

11701621009	Afroz Hossain Molla.	20	12	25	57	1	1	1
11701621010	PRABHAT KUMAR	16	15	23	54	1	1	1
11701621011	Arkaprabha Dutta	19	12	21	52	1	1	1
11701621012	Turbasu Roy	20	13	23	56	1	1	1
11701621013	Pritha Dutta	15	14	22	51	0	1	1
11701621014	Antara Dey Sarkar	18	13	25	56	1	1	1
11701621015	AVIK SAMADDER	18	14	21	53	1	1	1
11701621016	Anindita Guha Thakurta	17	12	20	49	1	1	1
11701621018	Md Tofiqul Islam Ansari	18	13	15	46	1	1	0
11701621019	Bikash Dorjee	16	12	25	53	1	1	1
11701621020	Sayan Mondal	19	15	23	57	1	1	1
11701621021	Ayan Dam	14	12	21	47	0	1	1
11701621022	SHINJINEE MONDAL	16	13	15	44	1	1	0
11701621025	Ankur Tikader	19	9	22	50	1	0	1
11701621036	Ankush Paul	20	13	25	58	1	1	1
11701621037	ROHIT ROY	17	14	21	52	1	1	1
11701621038	Manish Biswas	18	11	20	49	1	1	1
11701621039	Suvojit Banerjee	16	13	24	53	1	1	1
11701621040	Souvik Purkait	19	12	25	56	1	1	1
11701621041	Shivam Thakur	20	15	23	58	1	1	1
11701621042	Subhajit Biswas	14	12	21	47	0	1	1
11701621043	Alik Bhattacherjee	18	9	23	50	1	0	1
11701621044	Souvik Dutta	17	14	22	53	1	1	1
11701622018	SAYANTANI DAS	16	14	25	55	1	1	1
11701622019	Anish Paul	19	13	21	53	1	1	1
11701622020	SUBHADIP MONDAL	20	14	20	54	1	1	1
11701622021	DIBYENDU PATRA	16	11	24	51	1	1	1
11701622022	MAYANK MAJUMDER	19	13	25	57	1	1	1
11701622023	BIRJU MAJUMDER	20	12	23	55	1	1	1
11701622024	HILAL UDDIN	14	15	19	48	0	1	1
11701622025	SUBHAJIT BISWAS	18	9	23	50	1	0	1
Total No. of Students		37	37	37	37	32	34	35

Percentage of students who attained target	86 %	92%	95%		

Average of all Cos	**33.67**

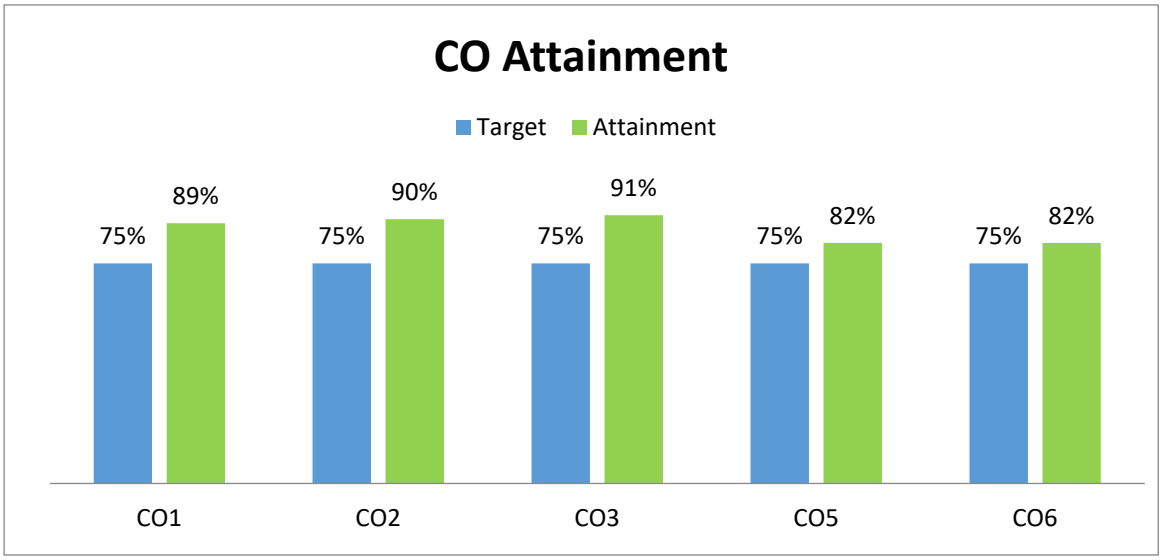
CO Attainment

RCC Institute of Information Technology
Course Outcome Attainment
Name of the Faculty: Avijit Saha
Course Code: ES ME-491
Course Name: Thermal Power Engineering Lab
Session: 2022 - 23

As per NBA SAR 3.3.1 : Record of Assessement Carried from different Sheets									
Total No of Students in the Class:			**37**						
S.No.	Exam	CO 1	CO 2	CO 3	CO 4	CO5	CO6	Target	Overall Achievement
1	PCA 1 (Quiz)	32	33	34	0	0	0	75%	33
2	PCA 2 (Assignment)	0	0	0	27	26	27	75%	27
3	External Exam	33.66667	33.66667	33.66667	33.66667	33.66667	33.66667	75%	34
	Average Assessement	33	33	34	30	30	30	75%	32

Record of Assessement Through PCA + External Exam					
Course Outcome	Target Course Outcome%	TOTAL STUDENTS	TOTAL STUDENT WHO ATTAINED OUTCOME	% STUDENTS WHO ATTAINED THE OUTCOME	Attainment Level of Each Course Outcome
CO1	75%	37	33	89%	3
CO2	75%	37	33	90%	3
CO3	75%	37	34	91%	3
CO4	75%	37	30	82%	3
CO5	75%	37	30	82%	3
CO6	75%	37	30	82%	3
CO	75%	37	32	86.04%	3

As per NBA SAR Example given in 3.2.2: Record of Attainment Level of A Course through External and PCA Assessments					
	Target Course Outcome%	TOTAL STUDENTS	TOTAL STUDENT WHO ATTAINED OUTCOME	% STUDENTS WHO ATTAINED THE OUTCOME	Attainment Level
PCA	75%	37	32	86%	3
External	75%	37	32	86%	3
Overall Attainment of Course Outcome=60% University +40% PCA					3



PO Attainment

RCC Institute of Information Technology
Program Outcome Attainment
Name of the Faculty: Avijit Saha
Course Code: ES ME-491
Course Name: Thermal Power Engineering Lab
Session: 2022 - 23

As per NBA SAR 3.1.2: MAPPING OF COURSE OUTCOME WITH PROGRAM OUTCOMES USING 1,2,3																
Total No of Students:		37														
S.No.	CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
1	CO1	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-
2	CO2	3	3	2	1	1	-	1	-	-	-	-	-	1	-	-

3	CO3	3	3	2	1	1	-	-	-	-	-	-	-	1	-	-
4	CO4	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
5	CO5	3	3	2	1	-	-	1	-	-	-	-	-	-	-	-
6	CO6	3	3	2	1	-	-	-	-	-	-	-	-	1	-	-
AVERAGE		2.83	2.50	1.83	1.00	1.00	###	1.00	###	###	###	###	###	1.00	1.00	###

0

As per NBA SAR 3.3.2 RECORD OF ATTAINMENT OF COURSE OUTCOMES WITH PROGRAM OUTCOMES

S.No.	Exam	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO 3
Direct Attainment		3	3	3	3	3	0	3	0	0	0	0	0	3	3	0
Indirect Attainment		3	3	3	3	3		3						3	3	
Overall Attainment		3	3	3	3	3	0	3	0	0	0	0	0	3	3	0
Final Attainment		2.83	2.50	1.83	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00

EXIT SURVEY FORM

(*Academic Year: 2023-24*)

Paste Passport size Recent Color Photograph

1. Personal Information

- Name:
- Father's/Mother's Name:
- Class Roll No:
- University Registration No:
- University Roll No:
- Mobile Number: E-Mail address:

2. Program

Program Title	Year of Admission	Entrance Examination	Rank	Proof/Supportive Documents
B. Tech in Electrical Engineering (EE)		AIEEE		Photo copy of Rank Card
		WBJEE		
		WBJELET		

3. Appearing for Higher Study

Program Title	Year of Admission	Entrance Examination	Rank/Score	Proof/Supportive Documents
		GATE /GRE / TOEFL / CAT (Put √ tick mark)		Photo copy of Rank Card

4. Academic Records

Semester	SGPA	Elective Subjects	Proof/Supportive Documents
1st			Photocopy of the each sem. Mark sheet
2nd			
3rd			
4th			
5th			
6th			
7th			
8th			

5. Placement Record

No of Opportunity Given	No of drives Attended	Selection - on Campus Placement	Selection - Off Campus Placement	Proof/Supportive Documents
				Copy of Offer/ Appointment Letter/

6. Industrial Training/Skill Enhancement Training

Year	Industry/Institute/organization	Duration of Training	Proof/Supportive Documents
1st			Certificates/any other documents relevant to training
2nd			
3rd			
4th			

7. Participation in Seminar/Workshop /Technical Events

Year	Name of the Event	Organized By	Rank Placed/Outcome Achieved	Proof/Supportive Documents
1st				Photocopy of Participation Certificate
2nd				
3rd				
4th				

8. Publication of Technical Article/Magazine/Any Research paper

Year	Title of the publication	Name of the Article/Magazine/ Conference/Seminar	Published/ Organized by	Proof/ Supporting Documents
1st				Photocopy of the Title Page of the publication/ Presentation Certificate

9. Activity as a Resource Person/ Membership in Professional Society

Year	1st	2nd	3rd	4th	Responsibility/ Contribution	Proof/Supportive Documents
Member of Committees/ Professional society						Notification of the Committee/ Membership Documents
Convener/ Organizer of the Event/workshop						
Editor of the Magazine/Technical article						

10. Participation in Sports/Cultural Activity/NSS

Year	Details of Sports/Cultural Activity/NSS	Organized By	Rank Placed	Proof/Supportive Documents
1st				Participation & or Rank Certificates,
2nd				
3rd				
4th				

11. Project work

Subject	Title of the Project	Project Guide/Mentor	Proof/Supportive Documents
Minor Project			1st page of the Project Report/Certificate of guide
Major Project			

DECLARATION OF THE STUDENT

I, Mr./Ms ……., Roll No. ……., Dept of ……., student of RCC Institute of Information Technology – Kolkata, do hereby, declare that, the entries made by me in the above are complete and true to the best of my knowledge and belief.

Signature of the Student: _____

Date: _____

Listing below the attainment of all the subjects in academic session 2022-23

RCC Institute of Information Technology

Department of Electrical Engineering

PO PSO Attainment

Session - 2022-23

1st Year 1st Semester

Sl. No.	Code	Name of The Subject	PO Attainment											
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	BS-CH101	Chemistry-I	1.2	0.7	0.4	0.4	0	0	0	0	0	0	0	0
2	BS-M102	Mathematics –IB	1.2	1	0.5	0.4	0	0	0.4	0	0	0	0.4	1.1
3	ES-EE101	Basic Electrical Engineering	1.78	1.6	2.3	1.6	2.1	0	0	0	0	0	0	1
4	BS-CH191	Chemistry-I Laboratory	1	1.5	1	3	0	0	0	0	0	0	0	0
5	ES-EE191	Basic Electrical Engineering Laboratory	1.83	2	2.5	1	2.4	1.5	1.3	1.7	2.4	2	2	2
6	ES-ME191	Engineering Graphics & Design	1.5	1.8	1.3	1	0	0	1	0	0	1.8	0	0

1st Year 2nd Semester

Sl. No.	Code	Name of The Subject	PO Attainment											
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	BS-PH201	Physics-I	0.67	1	0.73	0.8	0	0	0	0	0	0	0	0
2	BS-M202	Mathematics –IIB	1.2	1.2	0.8	0.5	0	0	0	0	0	0	0	0
3	ES-CS201	Programming for Problem Solving	2.45	2.5	1.4	1.4	2.2	0	0	1.3	0	0	0	1.8
4	HM-HU201	English	0	0	0	0	0	0	0	1.3	0	2.1	0	1.3
5	BS-PH291	Physics-I Laboratory	0.97	1.45	1.06	1.02	0	0	0	0	0	0	0	0

6	ES-CS291	Programming for Problem Solving	2.83	2.5	1.8	1.1	1.5	0	1.5	0	0	0	0	0
7	ES-ME292	Workshop/Manufacturing Practices	2	2	1	0	1	0.9	0.9	0.9	0.9	0	0.9	1
8	HM-HU291	Language Laboratory	0	0	0	0	0	0	0	2	0	3	0	2

2nd Year 3rd Semester

			PO Attainment											
Sl. No.	**Code**	**Name of The Subject**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	PC-EE 301	Electric Circuit Theory	2.46	2.1	1.4	1.2	1.8	0	0	0	0	0	0	1
2	PC-EE 302	Analog Electronics	2.73	2.6	2.6	0.9	1.3	0	0	0	0	0	0	2.7
3	PC-EE 303	Electro Magnetic Field Theory	2.1	2	1.4	0.8	0	0	0	0	0	0	0	0
4	ES-ME 301	Engineering Mechanics	1.64	0.8	0.8	0	0	0	0	0.7	0	0.7	0	0.8
5	BS- M 301	Mathematics-III	1.35	1.4	1	0.9	0	0	0	0	0	0	0	0
6	BS-301	Biology for Engineers	0	0.8	1.9	0	0	1.1	0	0	0	0	0	0.8
7	MC-EE 301	Indian Constitution	0	0	0	0	0	1	0	1	0	1	0	2
8	PC-EE 391	Electric Circuit Theory	3	2.9	2	1.4	2.9	0	0	0	0	0	0	1.4
9	PC-EE392	Analog electronic laboratory	3	2.7	2.3	1.3	2	0	0	0	0	0	0	1
10	PC-CS 391	Numerical Methods laboratory	1.23	1.3	1.7	1.4	1,67	0	0	1.9	0	0	0	0

2nd Year 4th Semester

			PO Attainment											
Sl. No.	**Code**	**Name of The Subject**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	PC-EE-401	Electric Machine-I	0.8	0.9	0.4	0	0	0	0.3	0	0	0	0.3	0.4
2	PC-EE 402	Digital Electronics	1.85	1.4	1.8	1.8	1.6	1.2	1.6	1.2	0.8	1.6	1.2	1.4

3	PC-EE 403	Electrical & Electronics Measurements	2.73	2.6	1.5	0.9	1.1	0	0	0	0	0	0	2.7
4	ES-EE 401	Thermal Power Engineering	1.2	1.1	0.7	0.6	0.4	0	0.4	0	0	0	0	0.4
5	HM-EE 401	Values and Ethics in Profession	1.25	1.8	2	1.6	1.4	0	0	0	0	0	0	1
6	PC-EE 491	Electric Machine-i Laboratory	2.5	2.2	1.7	1.5	1.6	0	0	0	0	0	0	1
7	PC-EE 492	Digital Electronics Laboratory	1.75	2.3	2.2	1.6	2	1.5	3	3	2.5	2	2	2
8	PC-EE 493	Electrical & Electronics Measurement Laboratory	3	2.7	2.3	1.3	2	0	0	0	0	0	0	1
9	ES-ME 491	Thermal power Engineering Laboratory	2.83	2.5	1.8	1	1	0	1	0	0	0	0	0

3rd Year 5th Semester

			PO Attainment											
Sl. No.	**Code**	**Name of The Subject**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	PC-EE 501	Electric Machine-II	0.98	0.9	0.8	0.5	0.5	0.4	0.4	0	0	0	0.4	0.5
2	PC-EE 502	Power System-I	1.16	1	1.2	0.6	0	0.5	0.5	0	0	0	0.5	0.6
3	PC-EE 503	Control System	1.2	1	0.9	0.7	1	0.7	0.7	0.3	0.7	0.8	0.9	1.1
4	PC-EE 504	Power Electronics	0.88	1.2	1.4	1.1	1	0	0	0	0	0	0	0.7
5	OE-EE-501A	Data Structure & Algorithm	3	2	1.7	1.3	2	2	2	2.3	2.2	1.8	2.2	2
6	PE-EE-501C	Renewable & Non-Conventional Energy	2.73	2.6	1.8	1.1	0	0	0	0	0	0	0	0
7	PC-EE 591	Electric Machine-II Laboratory	1.8	1.6	1.6	1	0	1	0.9	0.9	0.9	1	0.9	1
8	PC-EE 592	Power System-I Laboratory	1.5	1.7	1.3	1	1	1	0	0	0	1	0	1
9	PC-EE 593	Control System Laboratory	3	2.8	2.7	2.5	2.7	0.9	1.4	0	0	0	0.9	3
10	PC-EE 594	Power Electronics Laboratory	0.95	1.3	1.5	1.2	1.1	0	0	0	0	0	0	0.8

3rd Year 6th Semester

PO Attainment

Sl. No.	Code	Name of The Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	PC-EE-601	Power System-II	1.04	1.6	1.6	0.7	1.5	0.6	1.2	0.6	1.2	0	0	0.9
2	PC-EE-602	Microprocessor & Micro Controller	0.76	1.1	1.2	1	0.9	0	0	0	0	0	0	0.6
3	PE-EE-601A	Digital Control System	1.2	1.1	1	0.9	1	0.5	0.6	0.3	0.7	0.8	0.9	1.1
4	PE-EE-602A	Electrical and Hybrid Vehicle	2.73	2.3	1.5	1.4	2	0	0	0	0	0	0	2.7
5	OE-EE-601A	Digital Signal Processing	1.83	1.7	1.7	1.5	0.9	0.8	0	0	0	0	0	0
6	HM-EE-601	Economics for Engineers	1.16	1	1.3	0.6	0	0.7	0.5	0	0	0	0.7	0.6
7	PC-EE 691	Power System-II Laboratory	1.67	1.5	1.5	1	0	1	0.9	0.9	0.9	1	0.9	1
8	PC-EE 692	Microprocessor and Micro Controller Laboratory	0.95	1.3	1.5	1.2	1.1	0	0	0	0	0	0	0.8
9	PC-EE 681	Electrical and Electronics Design Laboratory	0.92	1.3	1.5	1	1	0	0	0	1	1	0.9	0.7

4th Year 7th Semester

			PO Attainment											
Sl. No.	Code	Name of The Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	PC-EE 701	Electric Drive	2.46	2.5	1.4	1.2	2.1	0	0	0	0	0	0	1.8
2	PE-EE 701C	Power Generation Economics	1.83	2.4	2.8	1.5	2.5	1	2.5	1.5	2.5	0	0	2.3
3	OE-EE-701B	Internet of Things	3	2.7	1.8	1.8	2.2	2.5	1.7	1	2.6	1.6	2	2.2
4	OE-EE 702C	Computer Network	3	3	3	2.5	2.8	2.3	2.5	1.8	1.5	2	2	3
5	HM-EE 701	Principle of Management	2.46	2.5	2.5	0	2.5	0	0.7	0	0.7	0	0	0
6	PC-EE 791	Electric Drive Laboratory	2.9	3	2	1.4	3	0	0	0	0	0	0	1.4
7	PW-EE 781	Project I	1.98	1.9	1.7	1	1.6	0.9	1.2	1.4	1.9	2.1	1.1	1.4

8	PW-EE 782	Seminar	2.75	1	2.3	1.4	2.4	1.5	1.7	2	2.3	2.7	1.8	1.8

4th Year 8th Semester

			PO Attainment											
Sl. No.	**Code**	**Name of The Subject**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	PC-EE 801	Utilization of Electric Power	2.67	2.5	2	1	1.3	0	0	0	0	0	0	1
2	PE- EE 801D	Industrial Automation and Control	2.1	1.6	1.2	1.4	2.1	0.7	0	0	0.7	0	1.4	0
3	OE-EE 801D	Sensors and Transducers	2.2	2.2	2.1	2	1	1	1	0	0	0.5	1.2	1.2
4	PW-EE 881	Project Stage II	2.33	2.5	2.2	1.8	2.3	1.9	1.7	2	2	2.3	1.5	2

Assessment of Program Educational Objectives (PEOs) for Undergraduate Program
For Alumni

Name of the Alumni _____

Year of Graduation_____

Dear participant,

Being alumni of the institution, your valuable opinion and suggestions will assist us to improve our program educational objective and consequently, the quality to best serve our stakeholders. Please take few minutes to respond to the short questionnaire given below:

Back ground information

Please respond to the questions below:

1. Are you currently employed? Yes ___ No ___; Self employed? Yes ___ No __;
2. Pursuing PG? Yes __ No __
3. Are you currently employed in your core technical field? Yes _ No _
4. Name & Address of your company/organization

   _____
5. Number of years you have worked in your present company/organization. _____ years/months
6. Type of organization you work for: (please tick one)
   - Graduate student ___
   - Industry ___
   - Public sector ___
   - Government ___
   - Independent (self employed) ___
   - Other [specify] ___
7. Your current designation _____ Summary of your job profile (Broad duties/responsibilities)

   _____
8. To what extent has your college education contributed and prepared you in the following PEOs:

4= best **3= good** **2= adequate** **1 =Poor**

PEOs of the Dept. of EE, RCCIIT	Rating (Put √)			
	4	3	2	1
PEO-1: Basic understanding of core electrical engineering built on foundation of physical science, mathematics, computing, and technology so as to pursue successful career/higher studies in EE.				
• **PEO-2:** Broad based knowledge of EE suitable for research, development and innovation to meet diverse and multidisciplinary needs of industry and society.				
• **PEO-3:** Adequate professional skills, to be analytical and logical so that they can quickly adapt to new work environment, assimilate information and solve challenging problems.				
• **PEO-4:** Self learning capability, leadership qualities with strong communication skills and working in teams.				
• **PEO-5:** Capacity to be productive with ethical values, conscious about social and environmental issues with lifelong learning attitude.				

Your Suggestions for improvement

_____

_____

_____

Thank you

Employers Survey
Program Educational Objectives (PEOs) for Undergraduate Program

Name of the Company/organization_____

Company/organization dealing with (Field of Specialization) _____

Through this questionnaire we wish to know as to what extent the college education has prepared the graduate in the following aspects of PEOs. Please provide your response on 3 point scale wherein:

(1) = Substantially meets Expectations (2) = Partially meets Expectations (3) Below the Expectations

PEOs of the Dept. of EE, RCCIIT	Scale		
	1	2	3
• **PEO-1:** Basic understanding of core electrical engineering built on foundation of physical science, mathematics, computing, and technology so as to pursue successful career/higher studies in EE.			
• **PEO-2:** Broad based knowledge of EE suitable for research, development and innovation to meet diverse and multidisciplinary needs of industry and society.			
• **PEO-3:** Adequate professional skills, to be analytical and logical so that they can quickly adapt to new work environment, assimilate information and solve challenging problems.			
• **PEO-4:** Self learning capability, leadership qualities with strong communication skills and working in teams.			
• **PEO-5:** Capacity to be productive with ethical values, conscious about social and environmental issues with lifelong learning attitude.			

Your Suggestions for improvement:

_____
_____
_____
_____

Thank you

Assessment of Program Educational Objectives (PEOs) for Undergraduate Program

For Parents

Name of the Student _____

Year of graduation_____

Name of the Parent & Occupation _____

Address _____

Dear Participant,

Being a responsible parent of our above student, your valuable opinions and suggestions will assist us to improve the Program Educational Objectives (PEOs) of the Dept. of Electrical Engineering, RCCIIT. Through this survey we wish to know as to what extent the education our department has satisfied you to prepare the Electrical Engineering graduates in the following aspects of PEOs. Please take few minutes to respond your opinion on 3 point scale given below:

(1) = Substantially meets Expectations (2) = Partially meets Expectations (3) Below the Expectations

PEOs of the Dept. of EE, RCCIIT	Rating		
	1	2	3
• **PEO-1:** Basic understanding of core electrical engineering built on foundation of physical science, mathematics, computing, and technology so as to pursue successful career/higher studies in EE			
• **PEO-2:** Broad based knowledge of EE suitable for research, development and innovation to meet diverse and multidisciplinary needs of industry and society.			
• **PEO-3:** Adequate professional skills, to be analytical and logical so that they can quickly adapt to new work environment, assimilate information and solve challenging problems.			
• **PEO-4:** Self learning capability, leadership qualities with strong communication skills and working in teams.			
• **PEO-5:** Capacity to be productive with ethical values, conscious about social and environmental issues with lifelong learning attitude.			

Your suggestions for improvement

_____

_____

_____

Thank you

Final Attainment

Direct Attainment	1.90	1.83	1.58	1.21	1.68	1.10	1.19	1.37	1.49	1.56	1.17	1.36		1.46	1.31	1.56
Indirect Attainment	2.80	2.60	2.20	2.00	2.10	2.30	2.50	2.00	2.50	2.20	2.10	2.00		2.70	2.65	2.40
Final Attainment	**2.08**	**1.98**	**1.70**	**1.37**	**1.76**	**1.34**	**1.45**	**1.50**	**1.69**	**1.69**	**1.36**	**1.49**		**1.71**	**1.58**	**1.73**
Target	2.00	2.00	1.80	1.50	2.00	1.50	1.50	1.50	1.70	1.70	1.50	1.50		2.00	2.00	2.00
Gap	-0.08	0.02	0.10	0.13	0.24	0.16	0.05	0.00	0.01	0.01	0.14	0.01		0.29	0.42	0.27
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3