DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY

GANGURU: VIJAYAWADA – 521 139

ASSESSMENT MANUAL

FOR

UNDERGRADUATE ENGINEERING

ACADEMIC YEAR: 2018- 19

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1. INTRODUCTION

The institution started implementing outcome based education from the academic year 2016-17 for all the undergraduate engineering programs. So, to develop assessment manual has become the prerequisite to evaluate Outcomes of the program

This assessment manual provides the detailed procedure on how to assess and evaluate course outcomes, program outcomes and program specific outcomes.

Need of outcome based education

Outcome based education is performance based education, it clearly focuses and organizes everything in an educational system that is essential for all the students and to be able to do successfully at the end of their course.

Outcome based Education is considered as an engineering qualification that gives recognition to graduates for the knowledge, skills and attitude/behavior they have acquired after the immediate completion of a program and after 4 years of graduation

To implement the outcome based education one need to have

1. Mission and vision
2. Program educational Objectives
3. Program Outcomes
4. Matrix of courses with program outcomes (curriculum map)
5. Outcome based teaching and learning delivery system
6. Program assessment and evaluation process
7. Continuing quality improvement Program

Vision: A vision statement is an ideological picture of what you want to accomplish or achieve

Mission: General statement of how you will achieve your vision

Program Educational objectives(PEOs):

Program educational objectives are broad statements that describe what graduates are expected to attain within a few (3 to 5)years after graduation.

Program Outcomes(POs) :

Program outcomes (POs) are precise statements outlining knowledge, Skills, attitudes, values and behavior that students are expected to know, and be able to follow, by the time they graduate.
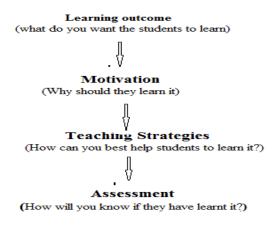
The attainment of POs is assessed by direct and indirect methods. Direct methods of assessment are essentially accomplished through direct examination or observation of student's knowledge and skills are being measured through performance indicators. on the other hand, indirect methods of assessment are based on ascertaining opinion or self-report. The results of assessment of each PO will be indicated as they play a vital role in implementing the continuous improvement of the program.

Outcomes: what the learners are expected to know and be able to do at the desired level of competence
Outcome helps to

- Provide direction in the planning of learning activity
- Focus on learner's behavior that has to be changed
- Serve as guidelines for content, instruction and evaluation
- Identify Specifically what should be learnt
- Convey to learners exactly what has to be accomplished

Outcome based teaching and learning delivery system

Learning outcome
(what do you want the students to learn)

⇩

Motivation
(Why should they learn it)

⇩

Teaching Strategies
(How can you best help students to learn it?)

⇩

Assessment
(How will you know if they have learnt it?)

Outcome for a course is framed based on

Course Objective:

- What the Teacher expects from the students is whether they have knowledge and be able to do (as a whole) at the end of instruction
- Not behavioral in nature
- One course objective may generate several learning outcomes
- Objective is intended results or consequences of instruction, curricula, programmes, or activities.

Course learning outcome:

- What the students are able to do(Specific)at the end of instruction
- Stated in behavioral terms
- Several learning outcomes are derived from one course objective
- Outcomes are achieved results or consequences of the evidence based on the learning progress

Course Outcomes are framed as per blooms taxonomy

HIGH ORDER THINKING

CREATE

EVALUATE

ANALYSIS

APPLY

UNDERSTAND

REMEMBER

LOW ORDER THINKING

Levels and Sample Action verbs which help to frame outcomes are listed below

Learning Domains: Learning is classified in to three domains namely cognitive (thinking), affective (emotion/feeling), and psychomotor (physical/kinesthetic). Each domain has a taxonomy associated with it.

Cognitive Domain (Blooms Taxonomy)

The cognitive domain involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills.

Category	*Key Words (verbs)*
Knowledge: Recall or retrieve previous learned information.	Defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states
Comprehension: Comprehending the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.	Comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, gives an example, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates
Applying: Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the work place.	Applies, changes, computes, constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses
Analyzing: Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences.	Analyzes, breaks down, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates
Creating: Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	Categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes
Evaluating: Make judgments about the value of ideas or materials.	Appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, justifies, relates, summarizes, supports

Affective Domain (**Krathwohl's Taxonomy)**

The affective domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes.

Category	*Key Words (verbs)*
Receiving Phenomena: Awareness, willingness to hear, selected attention.	Acknowledge, asks, attentive, courteous, dutiful, follows, gives, listens, understands
Responds to Phenomena: Active participation on the part of the learners. Attend and react to a particular phenomenon. Learning outcomes may emphasize compliance in responding, willingness to respond, or satisfaction in responding (motivation).	Answers, assists, aids, complies, conforms, discusses, greets, helps, labels, performs, presents, tells
Valuing: The worth or value a person attaches to a particular object, phenomenon, or behavior. This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalization of a set of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable.	Appreciates, cherish, treasure, demonstrates, initiates, invites, joins, justifies, proposes, respect, shares
Organization: Organizes values into priorities by contrasting different values, resolving conflicts between them, and creating an unique value system. The emphasis is on comparing, relating, and synthesizing values.	Compares, relates, synthesizes
Internalizes Values (characterization): Has a value system that controls their behavior. The behavior is pervasive, consistent, predictable, and most important characteristic of the learner. Instructional objectives are concerned with the student's general patterns of adjustment (personal, social, emotional).	Acts, discriminates, displays, influences, modifies, performs, qualifies, questions, revises, serves, solves, verifies

Psychomotor Domain (Simpson's (1973) Dave's (1975) Taxonomy)

Psychomotor objectives are those specific to discreet physical functions, reflex actions and interpretive movements. Traditionally, these types of objectives are concerned with the physically encoding of information, with movement and/or with activities where the gross

and fine muscles are used for expressing or interpreting information or concepts. This area also refers to natural, autonomic responses or reflexes.

Category	*Key Words (verbs)*
Perception (awareness): The ability to use sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.	Chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects.
Set: Readiness to act. It includes mental, physical, and emotional sets. These three sets are dispositions that predetermine a person's response to different situations (sometimes called mindsets).	Begins displays, explains, moves, proceeds, reacts, shows, states, volunteers.
Guided Response: The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing.	copies, traces, follows, react, reproduce, responds
Mechanism (basic proficiency): This is the intermediate stage in learning a complex skill. Learned responses have become habitual and the movements can be performed with some confidence and proficiency.	Assembles, calibrates constructs, dismantles displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, and organizes sketches.

Curriculum mapping

Constructive alignment is an approach commonly used to align teaching and learning activities to the stipulated course outcome(s) (COs). Nevertheless, many lecturers find it a daunting task to establish the link between COs and program outcome(s) (POs), for each lesson and assessment.

In order to facilitate the proper alignment of teaching and learning activities to its respective COs and POs, firstly preset all the CO:PO mapping (based on approved CO:PO matrix) in the course outline as well as lesson plan and update them accordingly.

 Secondly, request all lecturers to assign the assessments and examination questions with the correct COs:POs.

 Thirdly, for each type of assessment, allocate a table with predetermined COs:POs and scoring marks.

Finally, with the average percentage score of COs and POs, the Faculty can proceed with continuous quality improvement (CQI) where a comparison of scores from previous semester(s) can be made.

Assessment

It is a comprehensive process of describing ,judging and communicating the quality of learning and performance of students

Assesment includes measurment,evaluation and grading

What is assessment

Assessment is the systematic collection, review,and use of information about educational programs under taken for the purpose of improving student learning and development

Assessment for Learning focuses on the opportunities to develop students' ability to evaluate themselves, to make judgments about their own performance and improve upon it.

When assessment works best, it does the following:

Provides diagnostic feedback

- What is the student's knowledge base?
- What is the student's performance base?
- What are the student's needs?
- What has to be taught?

Evaluates progress

- How is the student doing?
- What teaching methods or approaches are most effective?
- What changes or modifications to a lesson are needed to help the student?

Performance Criteria:

Performance criteria are defined as the specific, measurable statements identifying the specific knowledge, skills, attitudes /or behavior students must demonstrate as indicators of achieving the outcome and confirmed through evidence

Rubrics

Rubrics are multidimensional sets of scoring guidelines that can be used to provide consistency in evaluating student work.

Rubrics basic purpose is to consistently and fairly assess a student's work should make it an important enough classroom tool, but there are two more reasons why we like rubrics.
They also help students see that learning is about gaining specific skills (both in academic subjects and in problem-solving and life skills), and they give students the opportunity to do self-assessment to reflect on the learning process.

Rubrics also help teachers authentically monitor a student's learning process to develop and revise a lesson plan. They provide a way for a student and a teacher to measure the quality of a body of work.
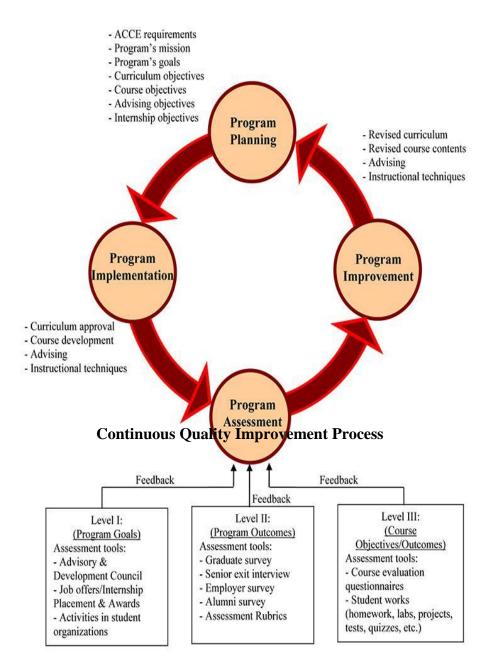
Evaluation :

Evaluation is a bench mark or a standard process where the accomplishment of a student is measured. Evaluation is one or more process done by the faculty or evaluation team for interpreting the data and evidence accumulated through assessment practices. Evaluation determines the extent to which program educational objectives and student outcomes are being attained Evaluation results in decisions and actions regarding program improvement.Evaluation gives value judgement.It is a statement about quality.

➢ **Continuous Quality Improvement**

The attainment of program outcomes helps in continuous improvement process

The Continuous Quality Improvement Process

Continuous Quality Improvement Process

2.VISION & MISSION

2.1. Institute Vision

Pioneering Professional Education through Quality

2.2. Institute Mission

- Providing Quality Education through State-of-art, infrastructure, laboratories and committed staff.
- Moulding students as proficient, competent and socially responsible engineering personnel with ingenious intellect.
- Involving faculty members and students in research and development works for betterment of society.

2.3. Department Vision

Emerge as Quality Human Resource Provider for Industry and Society in the field of Electrical & Electronics Engineering.

2.4. Department Mission

- Providing Quality Education through State-of-art resources.
- To develop innovative, proficient Electrical engineers.
- Promoting Ethical and moral values among the students so as to make them responsible professionals for the society.

3.PROGRAM PARAMETERS

3.1. Program Educational Objectives [PEOs]

Graduates of Electrical and Electronics Engineering shall

- Have strong foundation in Electrical Engineering along with Mathematics, Sciences and allied Engineering subjects.
- Possess good problem solving, design skills, capability to use modern engineering tools, ability to pursue higher education and research.
- Seek employment in various engineering or technological positions of their interest and continue to achieve their aspirations through lifelong learning.
- Exhibit professional and ethical attitude, effective communication skills, Teamwork and multidisciplinary approach.

3.2. Program Outcomes [POs]

Engineering graduates will be able to:
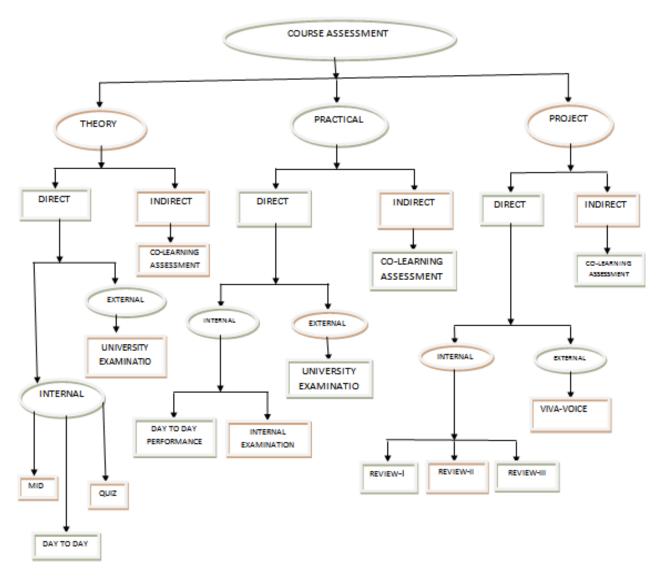
1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **ProblemAnalysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching sustained conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/Development of Solutions**: Design solutions for complex engineering problems and design system components or process that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **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.
5. **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.
6. **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.
7. **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.

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

9. **Individual and Team Work**: Function effectively as an individual, and as a member or a leader in diverse teams, and in multidisciplinary settings.

10. **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.

11. **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.

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

3.3. Programme Specific Outcomes

1. Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.
2. Able to design and develop the Green Electrical systems.

3.4. Course Assessment Methods weight age and Frequency of Data Collection

Fig Course Assessment Process

a) Course Assessment Process:

Each course is evaluated by the assessment of course outcomes by direct and indirect assessment tools which are predefined. Direct assessment is carried out by Internal and external assessment and indirect assessment is carried out by the course end survey (CO learning assessment). Schedule of direct assessments is prepared by the course coordinator while meeting the requirements of JNTUK regulations.

b) Assessment of theory courses:

Direct Assessment: Direct assessment of theory courses is carried out by Internal and External assessment of each defined outcome of a course. Internal assessment by Day to Day Evaluation, MID Examinations, Quiz Examinations and External Assessment by End Examination.

Internal Assessment:

i) Day to Day assessments: Is a means of enhancing the learning process of the students on regular basis, which is done by conduct of at least one class test and any other direct assessment tools (assignments ,Quiz, Surprise test objective

exams)etc as desired by the course coordinator after attending the teaching – learning process of particular course outcome.

ii) MID Examinations: Descriptive examinations are conducted as per the JNTUK schedule by the course coordinator for one and half an hour without choice. Two such examinations are conducted for a course covering all the course outcomes of the course.

iii) Quiz Examination: Objective exam for twenty minutes with twenty questions is conducted twice for a course with the question bank received from JNTUK on the day of exam as scheduled by JNTUK.

External Assessment:

iv) Semester end comprehensive examination is conducted by JNTUK for three hours.

Indirect Assessment:

v) Indirect assessment of theory course is carried out by conducting survey on course learning outcomes with the students at the end of the semester.

c) Assessment of Practical Courses:

Assessment of practical courses is carried out based on day to day performance, Internal and external examination and CO learning assessment.

i) Day to Day Evaluation: Practical courses focuses on application/applying the theories learnt in the class. Day to Day performance of the student is assessed by the evaluation of experimentation results, reports presented through lab records and vivo voce conducted after the completion of experimentation.

ii) Internal Examination: Almost at the end of the semester after completion of all the experiments an internal examination for three hours will be conducted by the course coordinator to assess the skills acquired by the student through theory classes and the practical sessions held.

iii) End Examination: Three hours exam conducted in the institution as per the schedule of JNTUK at a presence of an external examiner. The performance of the student in conducting the given experiment is evaluated by the external examiner along with vivo voce conducted at the end of experimentation to understand the correlation of the experimentation and the level of knowledge acquired by the student.

iv) CO learning Assessment (Indirect): Is carried by conducting survey on course learning outcomes with the students at the end of the semester.

d) Project:

Project works indulge students to improve their innovative and intellectual capabilities. Hence every effort is made to involve them in real time work by conducting frequent internal reviews by the project committee. Assessment is taken up through direct and indirect assessments.

Direct Assessment for project: It includes internal assessment which is carried by reviews and an external assessment which is carried by viva-voce.

i) Internal Assessment: Internal assessment is done by conducting four internal reviews namely Zero[th] Review, First Review, Second Review and Third Review.

Zero[th] Review: Student presents abstract and also mapping with the program outcomes which will be thoroughly reviewed and finalized by the project committee .

First Review: Students are instructed to make a PowerPoint presentation on the project giving an overview of the Model development and work progress (Evaluation phase I by a team of faculty).

Second Review: Students are instructed to submit Design/Experimental document of the project and give a PowerPoint presentation with Conclusion. (Evaluation phase II by a team of faculty).

Third Review: Students are instructed to submit complete project report and PowerPoint presentation for the project.

ii) External Evaluation: External evaluation is done by the assessment of project report, presentation of project and Vivo-voce conducted by the external examiner deputed by JNTUK along with Head of the Department and guide as per the schedules.

iii) Indirect Assessment: It is carried by conducting survey on course learning outcomes from the students after completion of their project course.

e)   Details of Assessment tools and frequency

Course	Description	Assessment type			Frequency	Evaluation done by
Theory (Direct)	Major learning of engineering fundamentals happens through theory courses which have desired outcomes and Continuous assessment of course outcomes drives students towards enthusiastic learning and thus improves the teaching – learning process.	Internal Assessment	Day to Day Assessments	Left to course coordinator	Minimum one for each outcome	Course coordinator
			MID-I, MID-II	Descriptive type	Twice for course mid and end of semester	Course coordinator
			Quiz-I, Quiz-II	Objective type	Twice for course mid and end of semester	JNTUK
		External Assessment	Course End /University Examination	Descriptive type	Once in a semester at the end	JNTUK
Theory (Indirect)		CO learning Assessment	Course end survey on outcomes		Once in a semester at the end	Course coordinator
Practical (Direct)	Provide students with firsthand experience with course concepts and	Internal Assessment	Experimentation, viva, Record		For every experiment	Course coordinator
			Internal exam		After completion of all experiments	Course coordinator

Practical (Indirect)	with the opportunity to explore methods used in their discipline.	External Assessment	Course End /University Examination		Once in a semester at the end	University appointed external
		CO learning Assessment	Course end survey on outcomes		Once in a semester at the end	Course coordinator
Project (direct)	Enhance student learning goals, including standards based content and skills such as critical thinking/proble m solving, collaboration and self-management	Internal Assessment	Zeroth Review	For title and abstract finalization	Once per course during the semester	Project evaluation committee
			First Review			
			Second Review			
			Third review			
		External Assessment	Viva Voice		Once in a semester at the end	University appointed external
Project (Indirect)		CO learning Assessment	Course end survey on outcomes		Once in a semester at the end	Course coordinator
Non External Examinat ion courses						

3.5. Attainment of Course Outcomes of all courses with respect to set attainment levels

Course outcome attainment is measured from the assessments as described above mentioned with weight ages below.

a.) Different assessment tools and their contributing weight ages toward attainment

Course	Assessment type			Weight age assigned	Scaled weight age	
Theory(Direct)	Internal	Each course outcome	Day to Day	20%	30%	80%
			MID	50%		
		QUIZ		30		
	Total Outcome weight age					
	External			100%	70%	
Theory(Indirect)	Co learning Assessment			100%		20%
Practical(Direct)	Internal	Each course outcome	Day to Day	60	30%	80%
		Internal exam		40		
	External			100%	70%	

Practical(Indirect)	Co learning Assessment			100%	20%
Project (Direct)	Internal	Each course outcome	Review wise	30%	80%
	External			70%	
Project (Indirect)	Co learning Assessment			100%	20%

b) Attainment levels for Course outcomes

Assessment		Attainment
Internal	**External**	
50% or less number of students scoring more than X_1% marks in internal assessment tools	50% or less number of students scoring more than X_2% marks in external assessment tools	1
51% to 69% of students scoring more than X_1% marks in internal assessment tools	51% to 69% of students scoring more than X_2% marks in external assessment tools	2
70% & above number of students scoring more than X_1 % marks in internal assessment tools	70% & above number of students scoring more than X_2% marks in external assessment tools	3

Table 3.2.2(b) Attainment levels for assessments

Set percentage of marks for Internal Assessments(X_1) =55%
Set percentage of marks for External Assessments (X_2) =45%

3.6.a. Proposed Activities (Co/Extra Curricular) To Fill Po Attainment Gaps

SNO	Activity	Type	Desired Frequency
1	Guest Lecturers	Co-Curricular	5 or More
2	Add-on Courses	Co-Curricular	3 or More
3	Projects Exhibition	Co-Curricular	Every Semester
4	Paper Presentations	Co-Curricular	Every Semester
5	NSS Activities	Extra-Curricular	Above 50%Students Participation
6	Program on Environment\ sustainability	Co-Curricular	3 or More
7	Programs on Ethics	Co-Curricular	3 or More
8	Ethical Practices – Like HonestyShops, Yoga, etc.,	Extra-Curricular	3 or More
9	Project Management & FinanceGuest Lecturers	Co-Curricular	3 or More
10	Library, Internet Hours	Co-Curricular	Both
11	Student Seminar &EnglishCommunication Hours	Co-Curricular	Both

12	Entrepreneurships – Lecturers	Co-Curricular	3 or More
13	Students Qualification in English certificatation / communication	Co-Curricular	Above 50%Students Participation
14	Programs on Health or Course on Human Anatomy	Co-Curricular	3 or More
15	Programs on Safety Engineering	Co-Curricular	3 or More
16	Programs on Intellectual Property Rights	Co-Curricular	3 or More
17	Programs on Business Laws	Co-Curricular	3 or More
18	Cultural Events, Activities	Extra-Curricular	Above 50%Students Participation
20	Industry Internships	Co-Curricular	10%
21	Industry Visits	Co-Curricular	3

3.6.b. Activity (Co-Curricular & Extra-Curricular) Attainment Rubrics

SNO	Activities	Poor (1)	Satisfactory (2)	Good (3)
1	Guest Lecturers	organized 1-2Guest Lecturers	Organized 3-4 Lecturers	Organized 5 or more Guest Lecturers
2	Add-on Courses	organized 1 Add-on Program	organized 2Add-onProgram	organized 3 or More Add-on Program
3	Projects Exhibition	No Project Exhibitions	Every Year	Every Semester
4	Paper Presentations	NIL	Every Year	Every Semester
5	NSS Activities	Less than 25% Student Participation	26-50% Students Participation	Above 50% Students Participate
6	Program on Environment\ sustainability	Nil	1-2 Programs	3 or More Programs
7	Programs on Ethics	Nil	1-2 Programs	3 or More Programs
8	Ethical Practices – Like Honesty Shops, Yoga, etc.,	Nil	1-2 Practices	3 or More Practices
9	Project Management & Finance Guest Lecturers	Nil	1-2 Lecturers	More Lecturers
10	Library, Internet Hours	Nil	Lib or Internet	Both
11	Student Seminar &English Communication Hours	Nil	Either	Both

12	Entrepreneurships – Lecturers	Nil	1-2 Lecturers	3 or More Lecturers
13	Students Qualification in English certificatation / communication	Nil	25%-50% Students	Above 50%Students
14	Programs on Health or Course on Human Anatomy	Nil	1-2 Programs	3 or More Programs
15	Programs on Safety Engineering	Nil	1-2 Programs	3 or More Programs
16	Programs on Intellectual Property Rights	Nil	1-2 Programs	3 or More Programs
17	Programs on Business Laws	Nil	1-2 Programs	3 or More Programs
18	Cultural Events, Activities	10-25%	26%-50%	51% & Above
20	Industry Internships	Nil	5%	10%
21	Industry Visits	1	2	3
22	Sports and games	10-25%	26%-50%	51% & Above

3.7. PO ASSESSMENT&ATTAINMENT

3.7.1. POs having more than 50% Courses contribution

SNO	Assessment Method	Assessment	Contribution weight age	
1	Direct	CO Assessment through courses	75%	80%
		Project	5%	
2	Indirect	Exit Feedback	5%	20%
		Alumni feedback	5%	
		Employer/Industry/Internship Feedback	5%	
		Parent Feedback	5%	

3.7.2. POs having less than 50% Courses contribution

SNO	Assessment method	Assessment	Contribution weight age	
1	Direct	CO Assessment through courses	60%	80%
		Project	5%	
		Activities	15%	
2	Indirect	Exit Feedback	5%	20%
		Alumni feedback	5%	
		Employee/Industry/Internship Feedback	5%	
		Parent Feedback	5%	

Department of Electrical and Electronics Engineering

3.7.3. Program target:

PO/PSO target are fixed as per strategy defined below:
PO/PSO target is fixed based on the maximum index level of mapping to Program outcomes\Program Specific Outcomes
Maximum attainment level for PO/PSO.

➢ Maximum attainment for PO/PSOs having more than 50% mapping with courses is considered as the sum of 80% of average mapping level of Direct assessment (through course outcomes) and 20% of average mapping level through indirect assessment (through surveys)

➢ Maximum attainment of PO/PSOs having less than 50% mapping with courses is considered as sum of 60% of average mapping level of Direct assessment (through course outcomes),20% of average mapping level of Direct assessment (through activities)and 20% of average mapping level through indirect assessment (through surveys)

Assessment Method	Assessment tool	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	% of contribution	**96.97**	**97**	**80.31**	**68.19**	**75.76**	**59.1**	**36.4**	**40.91**	**40.91**	**31.82**	**39.4**	**87.88**	**81.8**	**69.7**
Direct	courses	2.54	2.58	1.97	2.03	1.68	1.65	1.92	2.04	2.6	2.29	1.62	1.62	1.84	1.7
	Activities	3	2.34	2	2	1.8	2.45	1.6	2.5	2.6	3	2	3	1.5	2.5
Indirect	Surveys	3.00	3.00	2.67	3.00	2.92	2.75	2.67	3.00	2.75	2.92	2.75	2.92	2.92	2.75
Maximum index for PO		2.64	2.67	2.11	2.23	1.93	1.87	2.01	2.33	2.63	2.56	1.93	1.88	2.06	1.91

Rubrics of Previous and Current assessment years

Academic Year	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2016-17	85	85	85	85	85	85	85	85	85	85	85	80	85	85
2015-16	80	80	80	80	80	80	80	80	80	80	80	80	80	80
2014-15	75	75	75	75	75	75	75	75	75	75	75	75	75	75

Based on the observations of the previous year attainments and discussions made in the assessment committee this academic year targets are fixed as:

Target	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
assigned	2.24	2.27	1.79	1.90	1.64	1.59	1.71	1.98	2.24	2.18	1.64	1.50	1.75	1.62

Based on the PO target curriculum group wise targets are fixed as follows
GROUP WISE TARGET
Target for course is fixed based on the grouping of curriculum components

SNO	GROUP		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	BS&H	Map index	2.9	2.2	1.29	1.3	1	1.6	2.33	2.43	2.33	3	2	1.4	1.3	1
		Target	2.47	1.87	1.12	1.16	0.87	1.36	2.03	2.11	2.03	2.61	1.74	1.19	1.13	0.87
2	BE	Map index	3	2.17	1.84	0.8	1.2		0.34	0.34	1.84	0.5	1	1.5	1.17	0.5
		Target	2.55	1.84	1.60	0.73	1.02	0.00	0.30	0.30	1.60	0.44	0.87	1.28	1.02	0.44
3	MS	Map index	2.2	2.6	1.6	2	1.8	1.8	2	2	2.33	2.25	2.33	2		
		Target	1.87	2.21	1.39	1.74	1.52	1.53	1.74	1.74	2.03	1.96	2.03	1.70		
4	Core	Map index	2.39	2.78	2.1	2.2	1.7	1.5	1.38	1.73	2.64	1.91	1.2	1.54	1.857	1.818
		Target	2.04	2.37	1.82	1.87	1.48	1.31	1.20	1.50	2.29	1.66	1.04	1.31	1.62	1.58
5	Allied	Map index	2.67	2.33	2	3	3	1	1	3	2.5	2	1.33	1.67	1.667	1
		Target	2.27	1.99	1.74	2.61	2.61	0.85	0.87	2.61	2.18	1.74	1.16	1.42	1.45	0.87
6	Project	Map index	2	3	3	2	3	2	3	2	3	2	2	3	3	3
		Target	1.8	2.7	2.7	1.8	2.7	1.8	2.7	1.8	2.7	1.8	1.8	2.7	2.7	2.7

COURSE WISE TARGET

S No	Group	No	Code	Course Name	Course Target
1	Basic Sciences and Humanities	1	R16C101	English-I	2.61
		2	R16C102	Mathematics-I	2.61
		3	R16C103	engineering chemistry	2.61
		4	R16C106	Environmental studies	2.61
		5	R16C107	Chemistry lab	2.7
		6	R16C108	English lab	2.7

		7	R16C110	English-II	2.61
		8	R16C111	Mathematics – II	2.55
		9	R16C112	Mathematics – III	2.55
		10	R16C113	Engineering Physics	2.55
		11	R16C116	English - Communication Skills Lab-II	2.7
		12	R16C117	Engineering Physics Lab	2.7
2	Basic Engineering	1	R16C115	Engineering drawing	2.4
		2	R16C119a	Engineering Workshop	2.7
		3	R16C119b	IT Workshop	2.7
		4	R16C104	Engineering mechanics	2.4
		5	R16C105	C Programming	2.4
		6	R16C109	C Programming lab	2.7
3	Management Sciences	1	R16C206	Managerial Economics & Financial Analysis	2.61
		2	R13C301	Managerial Economics & Financial Analysis	2.61
		3	R13C309	IPR & Patents	2.61
		4	R13C315	Management Science	2.61
		5	R16C214	Management Science	2.61
4	Core	1	R16C114	Electrical Circuit Analysis-I	2.4
		2	R16C201	Electrical Circuit Analysis - II	2.55
		3	R16C202	Electrical Machines-I	2.4
		4	R16C203	Basic Electronics and Devices	2.4
		5	R16C204	Electro Magnetic Fields	2.4
		6	R16C208	Electrical Circuits Laboratory	2.7
		7	R16C209	Electrical Measurements	2.55
		8	R16C210	Electrical Machines-II	2.4
		9	R16C211	Switching Theory and Logic Design	2.4
		10	R16C212	Control Systems	2.4
		11	R16C213	Power Systems-I	2.55
		12	R16C215	Electrical Machines -I Laboratory	2.7
		13	R16C216	Electronic Devices & Circuits Laboratory	2.7
		14	R13C302	Electrical Measurements	2.55
		15	R13C303	Power Systems-II	2.55
		16	R13C304	Electrical Machines-III	2.61
		17	R13C305	Power Electronics	2.4
		18	R13C306	Linear & Digital IC Applications	2.4
		19	R13C307	Electrical Machines-II Lab	2.7
		20	R13C308	Control Systems Lab	2.7
		21	R13C310	Switchgear & Protection	2.55
		22	R13C311	Microprocessors & Microcontrollers	2.55
		23	R13C312	Utilization of Electrical Energy	2.55

24	R13C313	Power Systems Analysis	2.55
25	R13C314	Power Semiconductor Devices	2.61
26	R13C316	Power Electronics Lab	2.7
27	R13C317	Electrical Measurements Lab	2.7
28	R13C401	Renewable Energy Sources and Systems	2.61
29	R13C402	HVAC & DC Transmission	2.61
30	R13C403	Power System Operation & Control	2.55
31	R13C404	Energy Audit, Conservation and Management	2.55
32	R13C405	Electrical Distribution Systems	2.61
33	R13C406	Microprocessors & Microcontrollers Lab	2.7
34	R13C407	Electrical Simulation Lab	2.7
35	R13C408	Power Systems Lab	2.7
36	R13C409	Digital Control Systems	2.61
37	R13C410	High voltage engineering	2.55
38	R13C411	Electrical Power Quality	2.61
5	Allied	1	R16C205	Thermal and Hydro Prime Movers	2.4
		2	R16C207	Thermal and Hydro Laboratory	2.7
		3	R13C412	AI Techniques	2.61
6	Project	1	R13C413	Project	2.7

PART –A

YEAR WISE ATTAINMENT

5. Assessment-II Year of the Program

5.1. I-Semester

5.1.1. CO-PO Matrices

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R16C201.1	2	3	-	1	1	-	-	-	-	-	-	1
R16C201.2	2	3	1	1	1	-	-	-	-	-	-	1
R16C201.3	2	3	2	2	1	-	-	-	-	-	-	1
R16C201.4	2	2	3	-	-	-	-	-	-	-	-	1
R16C201.5	3	2	-	-	-	-	-	-	-	-	-	1
R16C201	3	3	2	2	1	-	-	-	-	-	-	1
R16C202.1	3	2	-	-	-	1	1	-	-	-	-	1
R16C202.2	2	3	-	-	-	-	-	-	-	-	-	1
R16C202.3	1	3	1	2	-	-	-	-	-	-	-	2
R16C202.4	2	3	1	-	-	-	1	-	-	-	-	1
R16C202.5	-	2	-	3	-	1	-	-	-	-	-	1
R16C202.6	1	3	-	1	-	-	1	-	-	-	-	1
R16C202	2	3	1	2	-	1	1	-	-	-	-	2
R16C203.1	3	3	-	-	-	-	-	-	-	-	-	-
R16C203.2	3	3	-	-	-	-	-	-	-	-	-	-
R16C203.3	3	3	1	1	-	2	-	-	-	-	-	-
R16C203.4	3	3	-	1	-	-	-	-	-	-	-	2
R16C203.5	3	3	-	-	-	-	-	-	-	-	-	2
R16C203.6	3	3	2	1	-	-	-	-	-	-	-	-
R16C203	3	3	1	1	-	1	-	-	-	-	-	1
R16C204.1	3	3	-	-	-	-	1	-	-	-	-	1
R16C204.2	2	3	-	-	-	-	1	-	-	-	-	1
R16C204.3	3	3	-	-	-	-	1	-	-	-	-	1
R16C204.4	2	3	-	-	-	-	1	-	-	-	-	1
R16C204.5	2	3	-	-	-	-	1	-	-	-	-	1
R16C204.6	3	3	-	-	-	-	1	Engineering	-	-	-	1
R16C204	3	3	-	-	-	-	1	-	-	-	-	1
R16C205.1	3	3	1	-		-	1	-	-	-	-	1
R16C205.2	3	3	1	-		-	1	-	-	-	-	1
R16C205.3	3	3	1	-		-	1	-	-	-	-	1

R16C205.4	3	3	1	-		-	1	-	-	-	-	1
R16C205.5	3	3	1	-		-	1	-	-	-	-	1
R16C205.6	3	3	1	-		1	1	-	-	-	1	1
R16C205	3	3	1	-	-	1	1	-	-	-	1	1
R16C206.1	3	3	-	2	2	-	3	2	-	-	3	1
R16C206.2	3	3	2	2	2	2	3	2	-	-	3	1
R16C206.3	3	1	-		-	-	-	3	-	-	3	1
R16C206.4	3	1	-	-	-	-	-	2	3	-	-	1
R16C206.5	3	2	-	2	-	-	-	2	-	2	3	1
R16C206.6	3	3	-	2	2	-	-	3	-	2	3	1
R16C206	3	3	1	2	-	1	1	-	-	-	-	1
R16C207.1	2	2	-	2	-	-	-	1	1	2	-	-
R16C207.2	2	2	-	3	-	-	-	2	2	2	-	-
R16C207.3	2	2	-	2	-	-	-	3	3	2	-	-
R16C207.4	2	2	-	3	-	-	-	2	3	2	-	-
R16C207.5	2	2	-	3	-	-	-	3	3	2	1	1
R16C207.6	2	2	-	3	-	-	-	2	3	2	1	1
R16C207	3	2	-	-	-	-	-	-	-	-	-	-
R16C208.1	2	2	2	3	2	1	-	2	2	2	-	1
R16C208.2	1	2	-	3	2	1	-	2	2	2	-	1
R16C208.3	1	2	-	3	2	1	-	2	2	2	-	1
R16C208.4	2	2	-	3	2	1	-	2	2	2	-	1
R16C208.5	2	2	1	3	2	-	-	2	2	2	-	1
R16C208	2	2	2	3	2	1	-	2	2	2	-	1

5.1.2. CO-PSO Matrices

CO's	PSO1	PS02
R16C201.1	1	-
R16C201.2	1	1
R16C201.3	1	-
R16C201.4	-	-
R16C201.5	-	-
R16C201	**2**	**-**
R16C202.1	1	2
R16C202.2	-	-
R16C202.3	-	-
R16C202.4	1	-
R16C202.5	-	-
R16C202.6	1	-
R16C202	1	2
R16C203.1	2	-
R16C203.2	2	-
R16C203.3	2	1
R16C203.4	2	1
R16C203.5	2	1
R16C203.6	2	-
R16C203.	2	1

R16C204.1	-	-
R16C204.2	-	-
R16C204.3	-	-
R16C204.4	-	-
R16C204.5	_	_
R16C204.6	_	_
R16C204.	-	-
R16C205.1	1	1
R16C205.2	1	1
R16C205.3	1	1
R16C205.4	1	1
R16C205.5	1	1
R16C205.6	1	1
R16C205	1	1
R16C206.1	-	-
R16C206.2	-	-
R16C206.3	-	-
R16C206.4	-	-
R16C206.5	-	-
R16C206.6	-	-
R16C206	-	-
R16C207.1	-	-
R16C207.2	-	-
R16C207.3	-	-
R16C207.4	-	-
R16C207.5	1	1
R16C207.6	1	1
R16C207	1	1
R16C208.1	2	2
R16C208.2	2	2
R16C208.3	2	2
R16C208.4	2	2
R16C208.5	2	2
R16C208	2	2

5.1.3 .List of Courses and their Contribution towards Attainment of Program Outcomes and Program Specific Outcomes

Course Code/Na	Course Outcome	Description	BTL	Connected POs	Connected PSOs
ECA-II R16C201	R16C201.1	Analyze three phase circuits under balanced and unbalanced	Analysis	1,2,4,5,12	1
	R16C201.2	Calculate transient response of electrical networks with AC and	Analysis	1,2,3,4,5,12	1,2
	R16C201.3	Estimate two port network parameters which includes Z,Y,ABCD,H and G	Analysis	1,2,3,4,5,12	1
	R16C201.4	Design as electrical network for a given transfer function	Synthesis	1,2,3,12	

	R16C201.5	Apply Fourier transforms to an electric network to extract harmonics	Application	1,2,12	
EM-I R16C202	R16C202.1	Explain the concepts of electromechanical energy conversion, Principle of operation of DC machine and classify various	Comprehension	1,2,6,7,12	1,2
	R16C202.2	Discuss the ill-effects of armature reaction, various characteristics of DC machines and methods to improve commutation	Understanding	1,2,12	
	R16C202.3	Demonstrate various speed control methods and testing of DC machines.	Application	1,2,3,4,12	
	R16C202.4	Analyze the performance of single phase transformers under all load conditions and draw the equivalent circuit of transformer.	Analysis	1,2,3,7,12	1
	R16C202.5	Predict regulation, losses and efficiency of single phase transformers and operate transformers in parallel.	Application	2,4,6,12	
	R16C202.6	Analyze various connections of three phase transformers, control voltages with tap changing methods and achieve three phase to two phase transformation.	Analysis	1,2,4,7,12	1
BED R16C203	R16C203.1	Outline the basic concepts of semiconductor physics.	Analysis	1,2	1
	R16C203.2	Analyze the operation and characteristics of diodes.	Analysis	1,2	1
	R16C203.3	Demonstrate the operation and design aspects of rectifiers and regulators.	Application	1,2,3,4,6	1,2
	R16C203.4	Differentiate the characteristics of CB,CE,CC transistor configurations and biasing techniques.	Analysis/ Analyzing	1,2,4,12	1,2
	R16C203.5	Analyze the operation and characteristics of FET, Thyristors, Power IGBTs and Power MOSFETs.	Analysis	1,2,12	1,2

	R16C203.6	Illustrate the role of feedback in amplifiers and oscillators.	Analysis/ Analyzing	1,2,3,4	1
EMF R16C204	R16C204.1	Calculate electric field and potentials using guass's law or solving laplace's or possion's	Analysis	1,2,7,12	
	R16C204.2	Evaluate the maxwell's equations in different forms and boundary conditions for fields at different	evaluation	1,2,7,12	
	R16C204.3	Calculate magnetic field intensity due to current ,the application of amperes law and the maxwell's	Analysis	1,2,7,12	
	R16C204.4	Evaluate the magnetic force and dipole moment in magnetic field.	evaluation	1,2,7,12	
	R16C204.5	Analyze the self mutual inductances and energy densities in a magnetic field	Analysis	1,2,7,12	
	R16C204.6	Evaluate pointing vector and Maxwell's equation for time varying fields	evaluation	1,2,7,12	
THPM R16C205	R16C205.1	Classify I C Engines, components and Evaluate their performances	Application	1,2,3,7,12	1,2
	R16C205.2	Evaluate Performance of Steam Turbines(Impulse and Reaction) against standard Air cycles(carnot & Rankine)	Application	1,2,3,7,12	1,2
	R16C205.3	Analyze Performance of Gas Turbines Operating on Simple cycle & Cycle with inter cooling, reheating & Regeneration	Analysis	1,2,3,7,12	1,2
	R16C205.4	Analyze Impact of jet on Vanes & Performance analysis of (Centrifugal & Reciprocating) Pumps	Analysis	1,2,3,7,12	1,2
	R16C205.5	Classify Hydraulic Turbines & Evaluate their Performances	Understanding	1,2,3,7,12	1,2
	R16C205.6	Estimate Water Potential & Load on Turbines	Understanding	1,2,3,6,7,11,12	1,2
MEFA R16C206	R16C206.1	Analyze the concept of managerial economics, Demand function, different methods of demand forecasting.	Analysis	1,2,4,5,7,8,11,12	

	R16C206.2	Discuss the concepts of production function , economies of scale, optimum size of the firm, cost &break even analysis	Understanding	1,2,3,4,5,6,7,8,11,12	
	R16C206.3	Describe market structure and pricing under varied market conditions	Knowledge	1,2,8,11,12	
	R16C206.4	Classify the types of business organizations and business cycles	Observation	1,2,8,9,12	
	R16C206.5	Prepare financial statements for analysis by using accounting tools.	Valuing	1,2,4,8,10,11,12	
	R16C206.6	Evaluate the projects by applying tools and techniques of capital budgeting to accept or reject the new projects in business.	Evaluation	1,2,4,5,8,10,11,12	
THPM LAB R16C207	R16C207.1	Classify Valve and port timing diagram of SI/CI Engines and Boilers	Application	1,2,4,8,9,10	
	R16C207.2	Evaluate the frictional power of an I.C. engine by Morse test and Retardation test	Application	1,2,4,8,9,10	
	R16C207.3	Conduct Performance test on 4S Diesel Engines and Heat Balance Sheet	Analysis	1,2,4,8,9,10	
	R16C207.4	Determine the coefficient of discharge of a fluid flow through Venturi meter and orifice meter and flow study of liquids on impact of	Analysis	1,2,4,8,9,10	
	R16C207.5	Evaluate Workdone and Efficiency of Pelton wheel Turbine	Understanding	1,2,4,8,9,10,11,12	1,2
	R16C207.6	Conduct performance Test on single stage centrifugal pump reciprocating pump	Understanding	1,2,4,8,9,10,11,12	1,2
ECA-I LAB R16C208	R16C208.1	Evaluate responses of networks by using Theorems	Evaluation	1,2,3,4,5,6,8,9,10,12	1,2
	R16C208.2	Calculate self , Mutual inductances of coupled circuits	Analysis	1,2,4,5,6,8,9,10,12	1,2

	Course Code		Taxonomy	POs	PSOs
	R16C208.3	Compute the parameters of Two Port Networks choke coil, electrical lamp	Applying	1,2,4,5,6,8,9, 10,12	1,2
	R16C208.4	Calculate the three phase power for balanced and unbalanced loads	Analysis	1,2,4,5,6,8,9, 10,12	1,2
	R16C208.5	Estimate the performance of R-L, R-C and R-L-C circuits with variation of parameters	Evaluation	1,2,3,4,5,8,9, 10,12	1,2

5.1.4. Attainment of courses- semester end

Course Code	Course Name	IntAtt (X_1)	Ext Att (X_2)	CO Learn Att (X_3)	Course Att	Remarks
R16C201	Electrical Circuit Analysis-II	1	2		1.5	
R13C202	Electrical Machines-I	3	0		1.5	
R16C203	Basic Electronics & Devices	2	0		1	
R16C204	Electro Magnetic Fields	3	0		1.5	
R16C205	Thermal & Hydro Prime Movers	3	0		1.5	
R16C206	Managerial economies and financial analysis	3	0		1.5	
R16C207	Thermal & Hydro Lab	3	3		3	
R16C208	Electrical Circuits Lab	3	3		3	

5.2. II-Semester

5.2.1. CO-PO Matrices

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R16C209.1	1	3	2	-	-	-	-	-	-	-	-	-
R16C209.2	2	3	-	-	-	-	-	-	-	-	-	-
R16C209.3	1	2	3	-	-	-	-	-	-	-	-	-
R16C209.4	1	3	-	-	-	-	-	-	-	-	-	-
R16C209.5	1	-	3	-	-	-	-	-	-	-	-	-
R16C209	2	3	3	-	-	-	-	-	-	-	-	-
R16C210.1	2	3	-	-	-	-	1	-	-	-	-	1
R16C210.2	1	3	-	1	1	-	-	-	-	-	1	1
R16C210.3	1	2	3	1	1	1	1	-	-	-	1	2

CO												
R16C210.4	-	2	-	3	-	-	1	1	-	-	-	1
R16C210.5	1	3	-	1	-	-	-	-	-	-	1	2
R16C210	2	3	3	2	1	1	1	1	-	-	1	2
R16C211.1	3	2	2	-	-	-	-	-	-	-	-	1
R16C211.2	3	2	2	-	-	-	-	-	-	-	-	1
R16C211.3	1	3	3	-	-	2	-	-	-	-	-	1
R16C211.4	1	3	3	-	-	2	-	-	-	-	-	1
R16C211.5	1	3	3	-	-	2	-	-	-	-	-	1
R16C211.6	1	3	3	-	-	2	-	-	-	-	-	1
R16C211	2	3	3	-	-	2	-	-	-	-	-	1
R16C212.1	2	3	-	2	2	1	-	-	-	-	-	1
R16C212.2	2	3	1	2	2	-	-	-	-	-	-	2
R16C212.3	2	3	-	2	2	-	-	-	-	-	-	2
R16C212.4	2	3	-	2	2	-	-	-	-	-	-	2
R16C212.5	2	2	3	2	2	-	-	-	-	-	-	2
R16C212.6	2	2	3	2	2	-	-	-	-	-	-	2
R16C212	2	3	2	2	2	1	-	-	-	-	-	2
R16C213.1	1	-	-	-	1	1	3	1	-	-	-	1
R16C213.2	2	3	1	-	-	1	-	-	-	-	-	1
R16C213.3	1	-	1	-	-	1	1	-	-	-	-	1
R16C213.4	1	3	1	-	-	-	-	-	-	-	-	1
R16C213.5	1	3	2	-	-	2	-	1	-	-	-	2
R16C213	2	3	2	-	1	2	2	1	-	-	-	2
R16C214.1	3	2	-	-	1	1	-	1	3	3	2	2
R16C214.2	3	2	-	3	3	1	-	1	-	-	1	2
R16C214.3	1	2	2	-	1	3	-	1	-	3	1	2
R16C214.4	3	3	-	3	1	1	-	1	-	-	3	2
R16C214.5	1	2	-	-	1	1	3	1	-	3	1	3
R16C214.6	1	2	-	-	1	1	3	1	-	-	1	2
R16C214	2	3	1	1	2	2	1	1	1	2	2	3
R16C215.1	2	-	2	3	1	-	1	-	2	1	-	-
R16C215.2	2	-	2	3	1	-	1	-	2	1	-	-
R16C215.3	2	-	2	3	1	-	1	-	2	1	-	-
R16C215.4	2	-	2	3	1	-	1	-	2	1	-	-
R16C215	2	-	2	3	1	-	1	-	2	1	-	-
R16C216.1	1	2	1	1	-	1	1	1	3	3	-	1
R16C216.2	2	3	1	3	-	-	-	2	3	2	-	1
R16C216.3	2	3	1	3	-	-	-	2	3	2	-	1
R16C216.4	2	3	1	3	-	-	-	2	3	2	-	1
R16C216.5	2	3	1	3	-	-	-	2	3	2	-	1
R16C216.6	2	3	1	3	-	-	-	2	3	2	-	1
R16C216	2	3	1	3	-	1	1	2	3	3	-	1

5.2.2. CO-PSO Matrices

CO's	PSO1	PS02
R16C209.1	1	-
R16C209.2	1	-
R16C209.3	1	-
R16C209.4	1	-
R16C209.5	1	-

R16C209	1	-
R16C210.1	1	1
R16C210.2	1	-
R16C210.3	1	-
R16C210.4	1	1
R16C210.5	1	1
R16C210	**1**	**1**
R16C211.1	1	-
R16C211.2	1	-
R16C211.3	1	-
R16C211.4	1	-
R16C211.5	1	-
R16C211.6	1	-
R16C211	1	-
R16C212.1	2	1
R16C212.2	2	1
R16C212.3	2	-
R16C212.4	2	-
R16C212.5	2	-
R16C212	2	-
R16C213.1	1	-
R16C213.2	-	1
R16C213.3	-	-
R16C213.4	-	-
R16C213.5	-	-
R16C213	1	1
R16C214.1	-	-
R16C214.2	-	-
R16C214.3	-	-
R16C214.4	-	-
R16C214.5	-	-
R16C214.6	-	-
R16C214	-	-
R16C215.1	1	2
R16C215.2	1	2
R16C215.3	1	2
R16C215.4	1	2
R16C215	1	2
R16C216.1	1	1
R16C216.2	1	1
R16C216.3	1	1
R16C216.4	1	1
R16C216.5	1	1
R16C216.6	1	1
R16C216	1	1

5.2.3. List of Courses and their Contribution towards Attainment of Program Outcomes and Program Specific Outcomes

Course name	Course Outcome	Description	BTL	Connected POs	Connected PSOs
EMS R16C209	R16C209.1	Choose correct type of instrument to measure Voltage, Current, Power, Energy & Frequency	Comprehension/ Understanding	1,2,3	1
	R16C209.2	Illustrate the applications of DC, AC Potentiometers	Application / Applying	1,2	1
	R16C209.3	Select suitable bridge for measurement of Electrical Parameters	Analysis/ Analyzing	1,2,3	1
	R16C209.4	Use Bridges, Potentiometers, Flux meter for measuring Magnetic Parameters	Application / Applying	1,2	1
	R16C209.5	Predict Phase difference, Electrical parameters by Digital Meters	Synthesis/ Evaluating	1,3	1
EM-II R16C210	R16C210.1	Explain the operation and performance of three phase induction motor and also starting methods of single phase induction	Comprehension/ Understanding	1,2,7,12	1,2
	R16C210.2	Analyze the torque-speed relations and complete performance of three phase induction motor	Analysis/ Analyzing	1,2,4,5,11,12	1
	R16C210.3	Illustrate the winding design and predetermine the regulation of synchronous generators.	Application / Applying	1,2,3,4,5,6,7,11,12	1
	R16C210.4	Operate synchronous generators in parallel	Application / Applying	2,4,7,8,12	1,2
	R16C210.5	Apply methods for staring, hunting prevention and correction of power factor with synchronous motor.	Application / Applying	1,2,4,11,12	1,2
STLD R16C211	R16C211.1	Describe the concepts of number systems, logic gates and codes	Understanding	1,2,3,12	1
	R16C211.2	Evaluate the logic and switching functions using Boolean theorems and K maps	Evaluation	1,2,3,12	1

	R16C211.3	Design small combinational circuits to build more complex combinational circuits	Evaluation	1,2,3,6,12	1
	R16C211.4	Design various digital circuits using PLD's	Evaluation	1,2,3,6,12	1
	R16C211.5	Design and analyze both synchronous and Asynchronous sequential circuits for real time applications	Evaluation	1,2,3,6,12	1
	R16C211.6	Design the clocked sequential circuit for given parameters so as to minimize a digital circuit	Evaluation	1,2,3,6,12	1
CS R16C212	R16C212.1	Calculate the transfer function of physical systems	Analysis	1,2,4,5,6,12	1,2
	R16C212.2	Determine time response specifications of second order systems and error constants of linear systems.	Analysis	1,2,3,4,5,12	1,2
	R16C212.3	Analyze stability of Liner time invariant systems using time domain analysis methods such as Routh's stability criterion and the root locus method.	Analysis	1,2,4,5,12	1
	R16C212.4	Analyze the stability of Liner time invariant systems using frequency response methods such as Nyquist, Bode and polar plots.	Analysis	1,2,4,5,12	1
	R16C212.5	Design Lag, Lead, Lag-Lead compensators to improve system performance by using Bode diagrams.	Synthesis	1,2,3,4,5,12	1
	R16C212.6	Develop the state model equations and identify the controllability and observability of a physical system.	Synthesis	1,2,3,4,5,12	1
PS-I R16C213	R16C213.1	Discuss the components of thermal & Nuclear power plants	Understanding	1,5,6,7,8,12	1
	R16C213.2	Distinguish between AC & DC distribution systems and also estimate voltage drops	Analysis	1,2,3,6,12	2
	R16C213.3	Describe the different components of an air and gas insulated substations.	Comprehension	1,3,6,7,12	

	R16C213.4	Calculate insulation resistance, stress and power factor of underground cables	Analysis	1,2,3,12	
	R16C213.5	Compute load curves and tariffs	Applying	1,2,3,6,8,12	
MS R16C214	R16C214.1	Describe the concept of management, functions, evolution of management thought and organizational structure	Understanding	1,2,5,6,8,9,10,11,12	
	R16C214.2	Applying the concept of work study ,statistical quality control and inventory management by using HML,FSN,ABC ,SDE analysis	Valuing	1,2,4,5,6,8,11,12	
	R16C214.3	Put forth the concepts of functional management	Understanding	1,2,3,5,6,8,10,11,12	
	R16C214.4	Apply the concepts of PERT & CPM in project management	Valuing	1,2,4,5,6,8,11,12	
	R16C214.5	knowledge on concepts of strategic management such as SWOT analysis ,generic strategy alternatives.	Knowledge	1,2,5,6,7,8,10,11,12	
	R16C214.6	Analyzing modern management practices MIS,TQM,SIX SIGMA,ERP.	Conceptualizing	1,2,5,6,7,8,11,12	
EM-I LAB R16C215	R16C215.1	Analyze the characteristics and calculate the efficiency of DC shunt machine.	Analysis	1,3,4,5,7,9,10	1,2
	R16C215.2	Analyze the performance of a transformer by conducting load and no load tests.	Analysis	1,3,4,5,7,9,10	1,2
	R16C215.3	Categories the characteristics and examine the efficiency of DC series machines.	Analysis	1,3,4,5,7,9,10	1,2
	R16C215.4	Distinguish various characteristics and test the efficiency of DC compound machine.	Analysis	1,3,4,5,7,9,10	1,2
EDC LAB	R13C216.1	Identify, Specify and Test different active, passive electronic components and instruments and perform soldering.	Manipulate	1,2,3,4,6,7,8,9,10,12	1,2

R16C216	R13C216.2	Evaluate the V-I characteristics of diodes	Evaluation	1,2,3,4,8,9,10,12	1,2
	R13C216.3	Design half wave and full wave rectifiers with and without filters using diodes	Application	1,2,3,4,8,9,10,12	1,2
	R13C216.4	Evaluate the performance characteristics of BJT,FET and UJT	Evaluation	1,2,3,4,8,9,10,12	1,2
	R13C216.5	Analyze the signal parameters of given signal using CRO	Analysis	1,2,3,4,8,9,10,12	1,2
	R13C216.6	Analyze the frequency response of amplifiers	Analysis	1,2,3,4,8,9,10,12	1,2

5.2.4. Attainment of Courses – Semester End

Course Code	Course Name	IntAtt (X_1)	Ext Att (X_2)	CO Learn Att (X_3)	Course Att	Remarks
R16C209	Electrical measurements	1	2		1.5	
R16C210	Electrical Machines-II	3	0		1.5	
R16C211	Switching Theory & Logic Design	3	0		1.5	
R16C212	Control Systems	3	0		1.5	
R16C213	Power Systems-I	2	1		1.5	
R16C214	Management science	3	0		1.5	
R16C215	Electrical Machines-I Lab	3	3		3	
R16C216	Electronics Devices & Circuits lab	3	3		3	

5.3. Academic year End PO and PSO Attainment

5.3.1. PO Wise Direct Attainment, Observations and proposed actions for Continuous Improvement through Courses

PO NO	Courses Contributing PO			Target	Attainment	
	No of courses (year)	Course Code	Course Name		Subject wise	overall
PO1	1	R13C102	Mathematics-I		1.5	2.04
	2	R13C103	Mathematics – I(Mathematical Methods)		1	
	3	R13C104	Engineering Physics		1.5	
	4	R13C106	Engineering Drawing		3	

5	R13C108	Engineering Physics Lab		1.5
6	R13C109	Engineering Physics – Virtual Labs		1.35
7	R13C110	Engg. Workshop& IT Workshop		1.5
8	R13C112	Mathematics – III		2.5
9	R13C113	Engineering Chemistry		1.5
10	R13C114	Engineering Mechanics		2.5
11	R13C115	Electrical Circuit Analysis-I		2
12	R13C116	Computer Programming		2.5
13	R13C117	Engineering Chemistry Lab		3
14	R13C119	C Programming Lab		3

Engineering Knowledge : Applicable knowledge of mathematics, science, and electrical engineering to solve complex engineering problems

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO2

ProblemAnalysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching sustained conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Target Level	Attainment Level	Observations
2.00		

Action 1:

PO3

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

Target Level	Attainment Level	Observations
2.00		

Action 1:

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.

Target Level	Attainment Level	Observations
2.00		

Action 1:

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.

Target Level	Attainment Level	Observations
2.00		

Action 1:

PO6

2.04

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

Target Level	Attainment Level	Observations
2.00		

Action 1:

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.	

Target Level	Attainment Level	Observations
2.00		

Action 1:

PO8

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO9

Individual and Team Work: Function effectively as an individual, and as a member or a leader in diverse teams, and in multidisciplinary settings.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:					
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.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:					
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

Target Level	Attainment Level	Observations
2.00	2.5	

PO12						

Action 1:

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

5.3.2. PSO Direct Attainment, observations and proposed action for Continuous Improvement Through Courses

PSO NO	**PO Contributing Course**			Target	**Attainment**	
	No of courses (year) (x)	Course Code	Course Name		Subject wise	overall
PSO1	1	R13C102	Mathematics-I	1.5		
	7					
	8					
	9					
	10					

	11					
	12					
	13					
	14					

Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO2

Able to design and develop the Green Electrical systems.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO NO	PO Contributing Course			Attainment		
	No of courses (year) (x)	Course Code	Course Name	Subject wise	Sum (Z)	overall (Z/X)
PSO1	1	R13C102	Mathematics-I	1.5		
	7					
	8					

9					
10					
11					
12					
13					
14					

Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO2						

Able to design and develop the Green Electrical systems.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

6. Assessment-III Year of the Program

6.1. I-Semester

6.1.1. CO-PO Matrices

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R13C301.1	3	3	-	2	2	-	3	2	-	-	3	1
R13C301.2	3	3	2	2	2	2	3	2	-	-	3	1
R13C301.3	3	1	-		-	-	-	3	-	-	3	1
R13C301.4	3	1	-	-	-	-	-	2	3	-	-	1
R13C301.5	3	2	-	2	-	-	-	2	-	2	3	1
R13C301.6	3	3	-	2	2	-	-	3	-	2	3	1
R13C301	3	3	1	2	1	1	1	3	1	1	3	1
R13C302.1	1	3	2	-	-	-	-	-	-	-	-	-
R13C302.2	2	3	-	-	-	-	-	-	-	-	-	-
R13C302.3	1	2	3	-	-	-	-	-	-	-	-	-
R13C302.4	1	3	-	-	-	-	-	-	-	-	-	-
R13C302.5	1	-	3	-	-	-	-	-	-	-	-	-
R13C302	2	3	3	-	-	-	-	-	-	-	-	-
R13C303.1	2	3	1	-	-	1	-	-	-	-	-	1
R13C303.2	2	2	3	-	2	1	-	-	-	-	-	2
R13C303.3	2	3	1	-	-	-	-	-	-	-	-	2
R13C303.4	2	3	1	-	-	2	-	-	-	-	-	2
R13C303.5	2	3	1	-	-	1	-	-	-	-	-	1
R13C303	2	3	2	-	2	2	-	-	-	-	-	2
R13C304.1	2	3		1	1							1
R13C304.2	2	3		1	1							1
R13C304.3	2	3		1	1							1
R13C304.4	2	3		1	1							1
R13C304.5	2	3		1	1							1
R13C304.6	3	2										1
R13C304	3	3		1	1							1
R13C305.1	3	1	1	2	2	2	-	-	-	-	-	1
R13C305.2	2	3	1	2	2	1	-	-	-	-	-	1
R13C305.3	2	3	1	2	2	1	-	-	-	-	-	1
R13C305.4	2	3	1	2	2	1	-	-	-	-	-	1
R13C305.5	2	3	1	2	2	1	-	-	-	-	-	1
R13C305.6	2	3	1	2	2	1	-	-	-	-	-	1

R13C305	3	3	1	2	2	2	-	-	-	-	-	1
R13C306.1	2	2	3	3	-	-	-	-	-	-	-	-
R13C306.2	2	2	3	3	-	-	-	-	-	-	-	-
R13C306.3	3	3	3	3	-	-	-	-	-	-	-	-
R13C306.4	3	3	3	3	-	-	-	-	-	-	-	-
R13C306.5	2	2	3	3	-	-	-	-	-	-	-	-
R13C306	3	3	3	3	-	-	-	-	-	-	-	-
R13C307.1	2	-	-	3	1	-	1	-	2	1	-	-
R13C307.2	2	-	-	3	1	-	1	-	2	1	-	-
R13C307.3	2	-	-	3	1	-	1	-	2	1	-	-
R13C307	2	-	-	3	1	-	1	-	2	1	-	-
R13C308.1	2	2	2	3	2	-	-	2	3	2	1	1
R13C308.2	2	2	2	3	2	-	-	2	3	2	-	1
R13C308.3	2	2	-	3	-	-	-	2	3	2	-	1
R13C308.4	2	2	-	3	2	-	-	2	3	2	-	1
R13C308.5	2	2	-	3	3	-	-	2	3	2	-	1
R13C308.6	1	1	-	3	-	-	-	2	3	2	-	1
R13C308	2	2	1	3	2	-	-	2	3	2	1	1
R13C309.1	-	-	1	-	-	1	1	3	-	1	-	1
R13C309.2	-	1	2	1	-	2	2	3	-	2	-	2
R13C309.3	-	1	2	2	-	2	2	3	-	2	-	2
R13C309.4	-	1	2	1	-	1	1	3	-	1	-	1
R13C309.5	-	1	2	2	-	2	1	3	-	1	-	1
R13C309.6	1	1	1	2	1	3	3	3	-	3	-	2
R13C309	1	1	2	2	1	2	2	3	-	2	-	2

6.1.2. CO-PSO Matrices

CO's	PSO1	PS02
R13C301.1	-	-
R13C301.2	-	-
R13C301.3	-	-
R13C301.4	-	-
R13C301.5	-	-
R13C301.6	-	-
R13C301	-	-
R13C302.1	1	-
R13C302.2	1	-
R13C302.3	1	-
R13C302.4	1	-
R13C302.5	1	-
R13C302	1	-
R13C303.1	-	-
R13C303.2	2	-
R13C303.3	2	-
R13C303.4	-	1
R13C303.5	-	-
R13C303	**1**	**1**
R13C304.1	1	2
R13C304.2	1	2
R13C304.3	1	2

R13C304.4	1	2
R13C304.5	1	2
R13C304.6	1	2
R13C304	1	2
R13C305.1	2	2
R13C305.2	2	2
R13C305.3	2	2
R13C305.4	2	2
R13C305.5	2	2
R13C305.6	2	2
R13C305	2	2
R13C306.1	3	3
R13C306.2	2	3
R13C306.3	3	3
R13C306.4	3	3
R13C306.5	2	3
R13C306	3	3
R13C307.1	3	1
R13C307.2	3	1
R13C307.3	3	1
R13C307	3	1
R13C308.1	2	1
R13C308.2	2	1
R13C308.3	-	1
R13C308.4	2	1
R13C308.5	3	2
R13C308.6	-	-
R13C308	2	1
R13C309.1	-	2
R13C309.2	-	2
R13C309.3	-	2
R13C309.4	-	2
R13C309.5	-	2
R13C309.6	-	2
R13C309	-	2

6.1.3.List of Courses and their Contribution towards Attainment of Program Outcomes and Program Specific Outcomes

Course code/Na	Course Outcome	Description	BTL	Connected POs	Connected PSOs
MEFA R13C301	R13C301.1	Analyze the concept of managerial economics, Demand function,	Analysis	1,2,4,5,7,8, 11,12	
	R13C301.2	Discuss the concepts of production function , economies of scale, optimum size of the firm, cost &break even analysis	Understand ing	1,2,3,4,5,6, 7,8,11,12	
	R13C301.3	Describe market structure and pricing under varied market conditions	Knowledge	1,2,8,11,12	

	R13C301.4	Classify the types of business organizations and business cycles	Observation	1,2,8,9,12	
	R13C301.5	Prepare financial statements for analysis by using accounting tools.	Valuing	1,2,4,8,10, 11,12	
	R13C301.6	Evaluate the projects by applying tools and techniques of capital budgeting to accept or reject the new projects in business.	Evaluation	1,2,4,5,8,1 0,11,12	
EMS R13C302	R13C302.1	Choose correct type of instrument to measure Voltage, Current, Power, Energy & Frequency	Comprehension/ Understanding	1,2,3	1
	R13C302.2	Illustrate the applications of DC, AC Potentiometers	Application / Applying	1,2	1
	R13C302.3	Select suitable bridge for measurement of Electrical Parameters	Analysis/ Analyzing	1,2,3,	1
	R13C302.4	Use Bridges, Potentiometers, Flux meter for measuring Magnetic Parameters	Application / Applying	1,2	1
	R13C302.5	Predict Phase difference, Electrical parameters by Digital Meters	Synthesis/ Evaluating	1,3	1
PS-II R13C303	R13C303.1	Determine resistance, inductance, capacitance of transmission lines	Analysis	1,2,3,6,12	
	R13C303.2	Design short , medium and Long transmission lines	Synthesis	1,2,3,5,6,1 2	1
	R13C303.3	Estimate surge behavior of long transmission line	Evaluating	1,2,3,12	1
	R13C303.4	Identify the important factors governing the performance of transmission line	Analysis	1,2,3,6,12	1,2
	R13C303.5	Calculate Sag, tension and string efficiency of overhead transmission lines	Analysis	1,2,3,6,12	2
EM-III R13C304	R13C304.1	Describe the construction, operation, starting of single phase Induction motor and also discuss the concept of A.C Series motor.	Understanding	1,2,3,,4,5,6 ,11,12	1,2

	R13C304.2	Analyze the armature windings, E.M.F equation, improvement of waveform and armature reaction of synchronous generators.	Analysis	1,2,3,5,6,12	1,2
	R13C304.3	Calculate voltage regulation of synchronous generators and analyze salient pole machine	Analysis	1,2,4,6,12	2
	R13C304.4	Demonstrate parallel operation of synchronous generators	Application	2,4,6,12	2
	R13C304.5	Illustrate the operation and performance of synchronous motor.	Analysis	1,2,4,6,11,12	2
	R13C304.6	Discuss the power circles, hunting of synchronous motor and principle of operation synchronous induction	Understanding	2,3,4,5,11,12	2
PE R13C305	R13C305.1	Explain the characteristics of various power semiconductor device and the operation of diode bridge rectifier	Understanding	1,2,3,4,5,6,12	1,2
	R13C305.2	Illustrate the firing circuits for SCR and the operation of AC voltage controller, half–wave phase controlled rectifiers	Analysis	1,2,3,4,5,6,12	1,2
	R13C305.3	Analyze the single phase converters	Analysis	1,2,3,4,5,6,12	1,2
	R13C305.4	Distinguish the three phase converters and dual converters.	Analysis	1,2,3,4,5,6,12	1,2
	R13C305.5	Discriminate the single phase cyclo converters and high frequency dc–dc converters.	Analysis	1,2,3,4,5,6,12	1,2
	R13C305.6	Apply PWM techniques for dc–ac converters	Application	1,2,3,4,5,6,12	1,2
LDIC R13C306	R13C306.1	Design and test differential amplifier configurations by using BJT's. and understand fundamental blocks of op-amp	Understanding	1,2,3,4	1,2
	R13C306.2	Acquire skills required to analyze op-amp parameters and fundamentals of voltage regulators.	Analysis	1,2,3,4	1,2

	R13C306.3	Design any type of amplifiers, comparators, converters, rectifiers by using operational amplifiers.	Analysis	1,2,3,4	1,2
	R13C306.4	Design and calculate the frequency response of multi-vibrators, PLL and all types of filter circuits by using linear integrated circuits.	Application	1,2,3,4	1,2
	R13C306.5	Understand the operation of analog to digital and digital to analog converters.	Analysis	1,2,3,4	1,2
EM-II LAB R13C307	R13C307.1	Analyze the performance of single phase transformer by conducting load and no load tests.	Analysis	1,4,5,7,9,10	1,2
	R13C307.2	Distinguish various characteristics and test the efficiency and regulation of synchronous machines	Analysis	1,4,5,7,9,10	1,2
	R13C307.3	Categories the characteristics and examine the efficiency of Induction motors.	Analysis	1,4,5,7,9,10	1,2
CS LAB R13C308	R13C308.1	Analysis of P,PI,PID controllers with and without temperature effect	Analysis	1,2,3,4,5,8,9,10,11,12	1,2
	R13C308.2	Design Lag, Lead, Lag-Lead Compensators	Synthesis	1,2,3,4,5,8,9,10,12	1,2
	R13C308.3	Analyze the Characteristics of synchros, magnetic amplifiers , stepper motor, AC and DC servomotors	Analysis	1,2,4,8,9,10,12	2
	R13C308.4	Calculate time domain specifications of Second order system for step input	Evaluating	1,2,4,5,8,9,10,12	1,2
	R13C308.5	Determine transfer function and control of DC Servo Motor and DC generator	Analysis	1,2,4,5,8,9,10,12	1,2
	R13C308.6	Demonstrate the function of potentiometers as error detector	Application	1,2,4,8,9,10,12	
IPR & PATENT	R13C309.1	Identify the types of Trade related Intellectual Property Rights and its importance	Understanding	3,6,7,8,10,12	2

R13C309	R13C309.2	Recognize the concepts of Copyright, its registration procedure and different laws related to copyrights	Understanding	2,3,4,6,7,8, 10,12	2
	R13C309.3	Identify the concepts of Patent Law, types Infringement and its application process	Comprehension	2,3,4,6,7,8, 10,12	2
	R13C309.4	Describe the concepts of Trade Mark and its registration process, Infringement, claims, litigations and its law	Understanding	2,3,4,6,7,8, 10,12	2
	R13C309.5	Recognize the concepts of Trade Secrets and its limitation	Understanding	2,3,4,6,7,8, 10,12	2
	R13C309.6	Explain the concepts of Cyber Crime, E-commerce and its aspects	Comprehension	1,2,3,4,5,6, 7,8,10,12	2

6.1.4. Attainment of courses- semester end

Course Code	Course Name	IntAtt (X_1)	Ext Att (X_2)	CO Learn Att (X_3)	Course Att	Remarks
R13C301	Managerial Economics & Financial Analysis	3	3		3	
R13C302	Electrical Measurements	3	2		2.5	
R13C303	Power Systems-II	3	0		1.5	
R13C304	Electrical Machines-III	2	3		2.5	
R13C305	Power Electronics	3	1		2	
R13C306	Linear &Digital IC Applications	3	2		2.5	
R13C307	Electrical Machines-II Lab	3	3		3	
R13C308	Control Systems Lab	3	3		3	
R13C309	IPR & Patents	3	3		3	

6.2. II-Semester

6.2.1. CO-PO Matrices

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R13C310.1	3	1	1	-	-	1	1	-	-	-	-	1
R13C310.2	3	-	1	-	-	1	-	-	-	-	-	1
R13C310.3	1	3	1	-	-	2	-	-	-	-	-	1
R13C310.4	-	3	1	-	1	-	-	-	-	-	-	1

R13C310.5	1	2	1	-	-	3	-	-	-	-	-	1
R13C310	2	3	1	-	1	2	1	-	-	-	-	1
R13C311.1	2	1	-	-	-	-	-	-	-	1	-	1
R13C311.2	2	1	-	-	-	-	-	-	-	1	-	1
R13C311.3	2	2	-	-	2	-	-	-	-	1	-	1
R13C311.4	1	1	3	-	2	2	-	-	1	1	-	1
R13C311.5	2	1	-	-	-	-	-	-	-	1	-	1
R13C311.6	1	1	3	2	2	2			1	1	1	1
R13C311	2	2	1	1	1	1	-	-	1	1	1	1
R13C312.1	2	3	2	-	2	2	-	-	-	-	1	3
R13C312.2	3	1	-	-	-	2	1	-	-	-	-	3
R13C312.3	3	1	-	-	-	1	-	-	-	-	-	1
R13C312.4	3	3	3	-	-	3	1	-	-	-	-	2
R13C312.5	3	3	-	-	-	1	1	-	-	-	-	1
R13C312.6	3	3	-	-	-	1	-	-	-	-	-	1
R13C312	3	3	1	-	1	2	1	-	-	-	1	2
R13C313.1	3	3	2	-	2		-	-	-	-	-	1
R13C313.2	3	3	2	1	3	2	-	-	-	-	1	2
R13C313.3	3	3	2	-	3		-	-	-	-	-	1
R13C313.4	2	3	2	2	1	2	1	-	-	-	-	2
R13C313.5	2	3	2	2	1	2	1	-	-	-	-	2
R13C313.6	2	3	-	-	-	2	1	-	-	-	-	2
R13C313	3	3	2	1	2	2	1	-	-	-	1	2
R13C314.1	3	2			1							
R13C314.2	2	3			1	1						
R13C314.3	3	2			1	1						2
R13C314.4	2	3				1						2
R13C314.5	3	2				1						2
R13C314.6	2	3				1						2
R13C314	3	3	-	1	1	-	-	-	-	-	-	2
R13C315.1	3	2	-	-	1	1	-	1	3	3	2	2
R13C315.2	3	2	-	3	3	1	-	1	-	-	1	2
R13C315.3	1	2	2	-	1	3	-	1	-	3	1	2
R13C315.4	3	3	-	3	1	1	-	1	-	-	3	2
R13C315.5	1	2	-	-	1	1	3	1	-	3	1	3
R13C315.6	1	2	-	-	1	1	3	1	-	-	1	2
R13C315	2	3	1	1	2	2	1	1	1	2	2	3
R13C316.1	2	2	-	3	1	-	-	2	3	2	-	1
R13C316.2	2	2	-	3	2	-	-	2	3	2	-	2
R13C316.3	2	2	-	3	2	-	-	2	3	2	-	2
R13C316.4	2	2	-	3	2	-	-	2	3	2	-	2
R13C316	2	2	-	3	2	-	-	2	3	2	-	2
R13C317.1	2	2	-	3	-	-	-	2	3	2	-	1
R13C317.2	2	2	-	3	-	-	-	2	3	2	-	1
R13C317.3	2	2	-	3	-	-	-	2	3	2	-	1
R13C317.4	2	2	-	3	-	-	-	2	3	2	-	1
R13C317.5	1	2	-	3	-	-	-	2	3	2	-	1
R13C317	2	2	-	3	-	-	-	2	3	2	-	1

6.2.2. CO-PSO Matrices

CO's	PSO1	PS02
R13C310.1	-	-
R13C310.2	-	-
R13C310.3	-	-
R13C310.4	1	2
R13C310.5	-	-
R13C310	1	2
R13C311.1	1	-
R13C311.2	1	-
R13C311.3	3	-
R13C311.4	3	2
R13C311.5	1	-
R13C311.6	3	2
R13C311	2	1
R13C312.1	1	3
R13C312.2	1	1
R13C312.3	1	2
R13C312.4	1	2
R13C312.5	1	2
R13C312.6	1	2
R13C312	1	2
R13C313.1	3	-
R13C313.2	3	-
R13C313.3	3	-
R13C313.4	1	-
R13C313.5	1	-
R13C313.6	-	1
R13C313	2	1
R13C314.1	2	2
R13C314.2	2	2
R13C314.3	2	2
R13C314.4	2	2
R13C314.5	2	2
R13C314.6	2	2
R13C314	2	2
R13C315.1	-	-
R13C315.2	-	-
R13C315.3	-	-
R13C315.4	-	-
R13C315.5	-	-
R13C315.6	-	-
R13C315	-	-
R13C316.1	1	1
R13C316.2	2	2
R13C316.3	2	2
R13C316.4	2	2
R13C316	2	2
R13C317.1	-	-
R13C317.2	-	-
R13C317.3	-	-

R13C317.4		-	-
R13C317.5		-	-
R13C317		-	-

6.2.3.List of Courses and their Contribution towards Attainment of Program Outcomes and Program Specific Outcomes

Course code/Name	Course Outcome	Description	BTL	Connected POs	Connected PSOs
SGP R13C310	R13C310.1	Explain the construction, working of circuit breakers	Understanding	1,2,3,6,7,12	
	R13C310.2	Distinguish the electromagnetic relays	Comprehension	1,3,6,12	
	R13C310.3	Choose the schemes for fault protection in power systems	Application	1,2,3,6,12	
	R13C310.4	Classify static and digital relays	Understanding	2,3,5,12	1,2
	R13C310.5	Apply the protection methods against over voltages and grounding practices	Application	1,2,3,6,12	
MPMC R13C311	R13C311.1	Describe the concepts of 8086 microprocessor architecture.	Understanding	1,2,10,12	1
	R13C311.2	Identify addressing modes, instruction set of 8086.	Understanding	1,2,10,12	1
	R13C311.3	Write assembly level language programs for 8086 microprocessor and 8051 microcontroller	Application	1,2,5,10,12	1
	R13C311.4	Interface memory units and other peripheral devices to the 8086 microprocessors	Application	1,2,3,5,6,9,10,12	1,2
	R13C311.5	Describe the concepts of 8051 Micro controller.	Understanding	1,2,10,12	1
	R13C311.6	Interface i/o devices to 8051 microcontroller.	Application	1,2,3,4,5,6,8,9,10,11,12	1,2

UEE R13C312	R13C312.1	Choose a suitable motor for electric drives and industrial applications.	Application	1,2,3,5,6,11,12	1,2
	R13C312.2	Recognize most appropriate heating or welding techniques for suitable applications.	Understanding	1,2,6,7,12	1,2
	R13C312.3	Describe the laws, measurement and sources of illumination	Understanding	1,2,6,12	1,2
	R13C312.4	Design of indoor, outdoor and flood lighting systems	Synthesis	1,2,3,6,7,12	1,2
	R13C312.5	Analyze the speed/time characteristics of traction motors.	Analysis	1,2,6,7,12	1,2
	R13C312.6	Calculate energy consumption levels in various modes of operation.	Analysis	1,2,6,12	1,2
PSA R13C313	R13C313.1	Sketch the impedance diagram and form Y_{bus} matrix for a power system network	Application /Applying	1,2,3,5,12	1
	R13C313.2	Find out the load flow solution for a power system network using load flow methods	Analysis/ Analyzing	1,2,3,4,5,6,11,12	1
	R13C313.3	Formulate the Z_{bus} for a power system network	Analysis/ Analyzing	1,2,3,5,12	1
	R13C313.4	Calculate the symmetrical fault currents	Synthesis/ Evaluating	1,2,3,4,5,6,7,12	1
	R13C313.5	Analyze the sequence components of currents for any unbalanced power system network	Synthesis/ Evaluating	1,2,3,4,5,6,7,12	1
	R13C313.6	Illustrate the steady state, transient and dynamic stability concepts of a power system	Analysis/ Analyzing	1,2,6,7,12	2
PSD	R13C314.1	Identify components of electric drive systems and braking methods	Analysis	1,2,6,12	2

R13C314	R13C314.2	Analyze the control of dc motors fed by three phase rectifiers.	Analysis	1,2,4,5,6,12	1,2
	R13C314.3	Illustrate chopper operation for the control of DC motors.	Application	1,2,4,5,6,12	1,2
	R13C314.4	Apply the controlling techniques for induction motor from stator side	Application	1,2,4,5,6,12	1,2
	R13C314.5	Choose the controlling techniques for induction motor from rotor side.	Application	1,2,4,5,6,12	1,2
	R13C314.6	Employ the controlling techniques for synchronous motors	Application	1,2,4,5,6,12	1,2
MS R13C315	R13C315.1	Describe the concept of management , functions, evolution of management thought and organizational structure	Understanding	1,2,5,6,8,9,10,11,12	
	R13C315.2	Applying the concept of work study ,statistical quality control and inventory management by using HML,FSN,ABC ,SDE analysis	Valuing	1,2,4,5,6,8,11,12	
	R13C315.3	Put forth the concepts of functional management	Understanding	1,2,3,5,6,8,10,11,12	
	R13C315.4	Apply the concepts of PERT & CPM in project management	Valuing	1,2,4,5,6,8,11,12	
	R13C315.5	Knowledge on concepts of strategic management such as SWOT analysis ,generic strategy alternatives.	Knowledge	1,2,5,6,7,8,10,11,12	
	R13C315.6	Analyzing modern management practices MIS,TQM,SIX SIGMA,ERP.	Conceptualizing	1,2,5,6,7,8,11,12	
PE LAB R13C316	R13C316.1	Analyze Characteristics of IGBT, MOSFET, SCR , Firing and Commutation Circuits of SCR	Analysis	1,2,4,5,8,9,10,12	1,2
	R13C316.2	Estimate the performance of converters for resistive and inductive loads	Evaluate	1,2,4,5,8,9,10,12	1,2

	R13C316.3	Analyze the performance of AC voltage controller and cyclo converter with resistive and inductive loads	Analysis	1,2,4,5,8,9, 10,12	1,2
	R13C316.4	Examine the working of Buck Boost converter , Single Phase Bridge and PWM inverter	Analysis	1,2,4,5,8,9, 10,12	1,2
EMS LAB R13C317	R13C317.1	Calibrate Single phase energy meter, PMMC Voltmeter, LVDT, Resistance Strain Guage	Analysis/ Analyzing	1,2,4,8,9,1 0,12	
	R13C317.2	Measure the Resistance, Inductance, Capacitance using Bridges	Synthesis/ Evaluating	1,2,4,8,9,1 0,12	
	R13C317.3	Calculate the Power by 1-⌀ Wattmeter, 3 Voltmeter, 3 Ammeter	Comprehension/ Understand.	1,2,4,8,9,1 0,12	
	R13C317.4	Measure the parameters of choke coil, % ratio error of a CT	Comprehension/ Understand.	1,2,4,8,9,1 0,12	
	R13C317.5	Test transformer oil for its effectiveness	Comprehension/ Understand.	1,2,4,8,9,1 0,12	

6.2.4. Attainment of courses- semester end

Course Code	Course Name	IntAtt (X_1)	Ext Att (X_2)	CO Learn Att (X_3)	Course Att	Remarks
R13C310	Switchgear & Protection	3	3		3	
R13C311	Microprocessors & Microcontrollers	3	2		2.5	
R13C312	Utilization of Electrical Energy	3	0		1.5	
R13C313	Power Systems Analysis	2	3		2.5	
R13C314	Power Semiconductor Devices	3	1		2	
R13C315	Management Science	3	2		2.5	
R13C316	Power Electronics Lab	3	3		3	
R13C317	Electrical Measurements Lab	3	3		3	

6.3. Academic year End PO and PSO Attainment

6.3.1. PO Wise Direct Attainment, Observations and proposed actions for Continuous Improvement through Courses

PO NO	Courses Contributing PO			Target	Attainment	
	No of courses (year)	Course Code	Course Name		Subject wise	overall
PO1	1	R13C102	Mathematics-I		1.5	2.04
	2	R13C103	Mathematics – I(Mathematical Methods)		1	
	3	R13C104	Engineering Physics		1.5	
	4	R13C106	Engineering Drawing		3	
	5	R13C108	Engineering Physics Lab		1.5	
	6	R13C109	Engineering Physics – Virtual Labs		1.35	
	7	R13C110	Engg. Workshop& IT Workshop		1.5	
	8	R13C112	Mathematics – III		2.5	
	9	R13C113	Engineering Chemistry		1.5	
	10	R13C114	Engineering Mechanics		2.5	
	11	R13C115	Electrical Circuit Analysis-I		2	
	12	R13C116	Computer Programming		2.5	
	13	R13C117	Engineering Chemistry Lab		3	
	14	R13C119	C Programming Lab		3	

Engineering Knowledge : Applicable knowledge of mathematics, science, and electrical engineering to solve complex engineering problems

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO2						

ProblemAnalysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching sustained conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Target Level	Attainment Level	Observations
2.00		

Action 1:						
PO3						

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

Target Level	Attainment Level	Observations
2.00		

Action 1:						
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.

Target Level	Attainment Level	Observations

	2.00				

Action 1:

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.

Target Level	Attainment Level	Observations
2.00		

Action 1:

PO6				2.04	

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

Target Level	Attainment Level	Observations
2.00		

Action 1:

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.

Target Level	Attainment Level	Observations
2.00		

Action 1:

PO8						

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO9						

Individual and Team Work: Function effectively as an individual, and as a member or a leader in diverse teams, and in multidisciplinary settings.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

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.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO12

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

6.3.2. PSO Direct Attainment, observations and proposed action for Continuous Improvement Through Courses

PSO NO	No of courses (year) (x)	Course Code	Course Name	Target	Attainment	
			PO Contributing Course		Subject wise	overall
PSO1	1	R13C102	Mathematics-I	1.5		
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					

Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO NO						
PSO2						

Able to design and develop the Green Electrical systems.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO NO	PO Contributing Course				Attainment		
	No of courses (year) (x)	Course Code	Course Name		Subject wise	Sum (Z)	overall (Z/X)
PSO1	1	R13C102	Mathematics-I		1.5		
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						

Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO2							

	Able to design and develop the Green Electrical systems.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

7. Assessment-IV Year of the Program

7.1. I-Semester

7.1.1.CO-PO Matrices

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R13C401.1	2	2	-	-	1	-	2	-	-	-	-	3
R13C401.2	-	2	1	-	-	2	2	-	-	-	1	3
R13C401.3	-	2	2	-	2	1	2	-	-	-	-	3
R13C401.4	-	2	2	-	2	1	2	-	-	-	-	3
R13C401.5	-	3	-	-	-	-	2	-	-	-	-	3
R13C401.6	2	-	-	-	-	-	2	-	-	-	-	3
R13C401	1	3	2	-	2	2	2	-	-	-	1	3
R13C402.1	3	3	3	2	2	-	1	-	-	1	-	1
R13C402.2	3	3	3	2	2	-	1	-	-	1	-	1
R13C402.3	3	3	3	2	2	-	1	-	-	1	-	1
R13C402.4	3	2	3	2	2	-	1	-	-	1	-	1
R13C402.5	2	1	3	2	2	-	1	-	-	1	-	1
R13C402.6	2	2	3	2	2	-	1	-	-	1	-	1
R13C402	3	3	3	2	2	-	1	-	-	1	-	1
R13C403.1	3	3	1	1	1	2	2	-	-	-	1	1
R13C403.2	2	3	1	1	1	2	2	-	-	-	1	1
R13C403.3	1	3	1	-	2	2	-	-	-	-	-	1
R13C403.4	2	3	2	-	2	-	-	-	-	-	-	1
R13C403.5	1	3	2	-	2	1	-	-	-	-	-	1
R13C403.6	2	3	-	1	1	1	-	-	-	-	-	1
R13C403	2	3	2	1	2	2	1	-	-	-	1	1
R13C404.1	2	2	1	-	-	-	1	-	-	-	-	-
R13C404.2	2	3	1	-	-	-	1	-	-	-	-	-
R13C404.3	2	3	1	-	-	-	1	-	-	-	-	-
R13C404.4	2	3	1	-	-	-	1	-	-	-	-	-
R13C404.5	2	2	1	-	-	-	1	-	-	-	-	-
R13C404	2	3	1	-	-	-	1	-	-	-	-	-
R13C405.1	3	1	1	-	-	1	-	-	-	-	1	1
R13C405.2	3	2	3	-	-	3	-	-	-	-	1	1
R13C405.3	2	3	-	-	1	2	-	-	-	-	-	1
R13C405.4	3	3	1	-	-	1	-	-	-	-	-	2
R13C405.5	2	2	3	-	1	-	-	-	-	-	-	1
R13C405.6	2	3	-	-	1	-	-	-	-	-	-	1
R13C405	3	3	2	-	1	2	-	-	-	-	1	2
R13C406.1	1	1	3	2	3	-	-	1	2	1	-	1
R13C406.2	1	1	3	2	3	-	-	1	2	1	-	1
R13C406.3	3	2	3	3	2	2	-	2	3	2	-	2
R13C406.4	2	1	2	2	1	-	-	-	3	2	-	2

R13C406	2	2	3	3	3	2	-	2	3	2	-	2
R13C407.1	2	2	-	3	3	-	-	1	3	2	-	2
R13C407.2	2	2	3	3	3	-	-	1	3	2	-	2
R13C407.3	2	1	3	3	3	-	-	1	3	2	-	2
R13C407.4	2	3	2	3	3	-	-	1	3	2	-	2
R13C407.5	2	2	3	3	3	-	-	1	3	2	-	2
R13C407	2	2	-	3	3	-	-	1	3	2	-	2
R13C408.1	2	3	2	3	3	-	-	2	3	2	-	2
R13C408.2	1	-	-	3	-	1	-	2	3	2	-	2
R13C408.3	2	3	1	3	3	-	-	2	3	2	-	2
R13C408.4	1	3	3	3	3	1	-	2	3	2	-	2
R13C408	2	3	2	3	3	1	-	2	3	2	-	2

7.1.2. CO-PSO Matrices

CO's	PSO1	PS02
R13C401.1	1	3
R13C401.2	-	3
R13C401.3	2	3
R13C401.4	2	3
R13C401.5	-	2
R13C401.6	-	-
R13C401	2	3
R13C402.1	-	-
R13C402.2	-	2
R13C402.3	3	2
R13C402.4	3	2
R13C402.5	3	2
R13C402.6	3	2
R13C402	2	2
R13C403.1	1	3
R13C403.2	1	1
R13C403.3	2	1
R13C403.4	2	1
R13C403.5	2	1
R13C403.6	1	1
R13C403	2	2
R13C404.1	2	1
R13C404.2	2	1
R13C404.3	2	1
R13C404.4	2	1
R13C404.5	2	1
R13C404	2	1
R13C405.1	1	2
R13C405.2	1	-
R13C405.3	2	-
R13C405.4	1	1
R13C405.5	1	2
R13C405.6	3	2
R13C405	2	2
R13C406.1	2	1

R13C406.2	2	1
R13C406.3	2	2
R13C406.4	2	1
R13C406	2	2
R13C407.1	3	1
R13C407.2	3	1
R13C407.3	3	1
R13C407.4	3	1
R13C407.5	3	1
R13C407	3	1
R13C408.1	3	-
R13C408.2	-	1
R13C408.3	3	-
R13C408.4	3	1
R13C408	3	1

7.1.3.List of Courses and their Contribution towards Attainment of Program Outcomes and Program Specific Outcomes

Course code/Na	Course Outcome	Description	BTL	Connected POs	Connected PSOs
RESS R13C401	R13C401.1	Analyze solar radiation data on earth's surface.	Analysis	1,2,5,7,12	1,2
	R13C401.2	Categorize solar thermal collectors.	Analysis	2,3,6,7,11, 12	1
	R13C401.3	Design solar photo voltaic systems.	Evaluation	2,3,5,6,7,1 2	1,2
	R13C401.4	Develop maximum power point techniques in wind system.	Evaluation	2,3,5,6,7,1 2	1,2
	R13C401.5	Illustrate the working principle of Hydro and tidal power systems	Analysis	2,7,12	2
	R13C401.6	Explain the basic principle and working of biomass, fuel cell and	Understand ing	1,7,12	
HVAC& DC R13C402	R13C402.1	Describe HV transmission system with regard to power handling capacity, losses, conductor	Knowledge / Rememberi	1,2,3,4,5,7, 10,12	
	R13C402.2	Explain ability for determining corona, radio interference, audible	Comprehen sion /	1,2,3,4,5,7, 10,12	2
	R13C402.3	Arrange transmission of HVDC power with regard to terminal	Knowledge /	1,2,3,4,5,7, 10,12	1,2
	R13C402.4	Analyze the choice of pulse conversion, control characteristics	Analysis/ Analyzing	1,2,3,4,5,7, 10,12	1,2
	R13C402.5	Discuss the knowledge of reactive power requirements of conventional	Comprehen sion /	1,2,3,4,5,7, 10,12	1,2
	R13C402.6	Calculate voltage and current harmonics and design of filters for	Analysis/ Analyzing	1,2,3,4,5,7, 10,12	1,2

PSOC R13C403	R13C403.1	Compute optimal scheduling of Generators.	Application / Applying	1,2,3,4,5,6, 7,11,12	1,2
	R13C403.2	Execute optimal hydro thermal scheduling	Application / Applying	1,2,3,4,5,6, 7,11,12	1,2
	R13C403.3	Workout the solution for unit commitment problem.	Analysis/ Analyzing	1,2,2,5,6,1 2	1,2
	R13C403.4	Illustrate the importance of the load frequency control.	Analysis/ Analyzing	1,2,3,5,12	1,2
	R13C403.5	Apply the PID controllers in single area and two area systems.	Application / Applying	1,2,3,5,6,1 2	1,2
	R13C403.6	Compare different methods and devices to control and compensate	Analysis/ Analyzing	1,2,4,5,6,1 2	1,2
ECM R13C404	R13C404.0 1	Explain energy efficiency, conservation and various technologies	Understand ing	1,2,3,7	1,2
	R13C404.0 2	Design energy efficient lighting systems	Analyzing	1,2,3,7	1,2
	R13C404.0 3	Calculate power factor of systems and propose suitable compensation	Analyzing	1,2,3,7	1,2
	R13C404.0 4	Explain energy conservation in HVAC systems	Analyzing	1,2,3,7	1,2
	R13C404.0 5	Calculate life cycle costing analysis and return on investment on energy	Analyzing	1,2,3,7	1,2
EDS R13C405	R13C405.1	Describe the various factors and characteristics of loads connected to distribution system	Understand ing	1,2,3,6,11, 12	1,2
	R13C405.2	Design the substation and feeders.	Creating	1,2,3,6,11, 12	1
	R13C405.3	Determine the voltage drop and power loss of distribution lines.	Evaluation	1,2,5,6,12	1
	R13C405.4	Conduct fault analysis to select protective devices and its	Analysis	1,2,3,6,12	1,2
	R13C405.5	Design capacitive compensation for power factor improvement.	Synthesis	1,2,3,5,12	1,2
	R13C405.6	Illustrate voltage control equipment and their effects on voltage	Analysis	1,2,5,12	1,2
MPMC LAB R13C406	R13C406.1	Write 8086 microprocessor assembly language programs for arithmetic, logical, string, Special	Application	1,2,3,4,5,8, 9,10,12	1,2
	R13C406.2	Do modular and Dos/Bios programming using 8086	Application	1,2,3,4,5,8, 9,10,12	1,2
	R13C406.3	Interface 8086 with 8255,8259 ,8279 & stepper motor	Design	1,2,3,4,5,6, 8,9,10,12	1,2

	R13C406.4	Perform the parallel port operations, Timer modes, serial	Understand	1,2,3,4,5,9, 10,12	1,2
ES LAB R13C407	R13C407.1	Analyze the RLC circuits, single machine connected to infinite bus(SMIB) and the three phase	Analyze	1,2,4,5,8,9, 10,12	1,2
	R13C407.2	Synthesize the Integrator and Differentiator circuits, Buck	Evaluation	1,2,3,4,5,8, 9,10,12	1,2
	R13C407.3	Design the DC separately excited motor and 5th order system using	Evaluation	1,2,3,4,5,8, 9,10,12	1,2
	R13C407.4	Develop the load flow solution for a given network, modeling of	Evaluation	1,2,3,4,5,8, 9,10,12	1,2
PS LAB R13C408	R13C408.1	Determine the parameters of various power system components occur in power system studies	Synthesis/ Evaluating	1,2,3,4,5,8, 9,10,12	1
	R13C408.2	Calibrate Tong Tester with Standard Meter	Application /Applying	1,4,6,8,9,1 0	2
	R13C408.3	Analyze Transient Stability for a given system	Analysis/ Analyzing	1,2,3,4,5,8, 9,10,12	1
	R13C408.4	Design the frequency control of a system With and Without	Synthesis/ Evaluating	1,2,3,4,5,6, 8,9,10,12	1,2

7.1.4. Attainment of Courses – Semester End

Course Code	Course Name	IntAtt (X_1)	Ext Att (X_2)	CO Learn Att (X_3)	Course Att	Remarks
R13C401	Renewable Energy Sources and Systems	3	2		2.5	Excellent
R13C402	HVAC & DC Transmission	3	2		2.5	Excellent
R13C403	Power System Operation & Control	3	2		2.5	Excellent
R13C404	Energy Audit, Conservation and Management	3	2		2.5	Excellent
R13C405	Electrical Distribution Systems	3	2		2.5	Excellent
R13C406	Microprocessors & Microcontrollers Lab	3	3		3	Excellent
R13C407	Electrical Simulation Lab	3	3		3	Excellent
R13C408	Power Systems Lab	3	3		3	Excellent

7.2. II-Semester

7.2.1. CO-PO Matrices

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R13C409.1	3	3										-
R13C409.2	3	2										1
R13C409.3	2	3										1
R13C409.4	2	3										1
R13C409.5	3	2	1		1							1

CO's												
R13C409.6	3	2	1									1
R13C409	3	3	1	-	1	-	-	-	-	-	-	1
R13C410.1	3	3	2	2	2	1	-	-	-	1	-	1
R13C410.2	3	3	2	2	2	1	-	-	-	1	-	1
R13C410.3	3	3	2	2	2	1	-	-	-	1	-	1
R13C410.4	3	3	2	2	2	1	-	-	-	1	-	1
R13C410.5	3	3	2	2	2	1	-	-	-	1	-	1
R13C410.6	3	3	2	2	2	1	-	-	-	1	-	1
R13C410	3	3	2	2	2	1	-	-	-	1	-	1
R13C411.1	3	3	-	-	-	-	-	-	-	-	-	-
R13C411.2	3	3	3	-	-	-	-	-	-	-	-	-
R13C411.3	3	3	3	-	-	-	-	-	-	-	-	-
R13C411.4	3	3	3	-	2	-	-	-	-	-	-	-
R13C411.5	3	3	-	-	-	3	3	-	-	-	-	-
R13C411.6	3	-	3	-	1	-	-	-	-	-	-	-
R13C411	3	3	3	-	1	3	3	-	-	-	-	-
R13C412.1	3	-	-	-	-	-	-	-	-	-	-	-
R13C412.2	3	2	1	-	3	1	-	-	1	-	1	-
R13C412.3	2	2	3	2	3	1	-	-	1	-	1	2
R13C412.4	2	2	3	2	-	1	-	-	1	-	1	-
R13C412.5	2	2	3	-	-	1	-	-	1	-	1	3
R13C412.6	-	2	2	3	2	1	-	-	2	-	2	3
R13C412	3	2	3	3	3	1	-	-	2	-	2	3

7.2.2. CO-PSO Matrices

CO's	PSO1	PS02
R13C409.1	-	1
R13C409.2	-	-
R13C409.3	-	1
R13C409.4	-	1
R13C409.5	1	1
R13C409.6	-	1
R13C409	1	1
R13C410.1	-	1
R13C410.2	-	-
R13C410.3	-	1
R13C410.4	-	1
R13C410.5	-	1
R13C410.6	-	1
R13C410	-	1
R13C411.1	-	-
R13C411.2	-	-
R13C411.3	-	2

R13C411.4	3	-
R13C411.5	-	-
R13C411.6	3	-
R13C411	3	2
R13C412.1	-	1
R13C412.2	3	1
R13C412.3	3	1
R13C412.4	2	-
R13C412.5	2	-
R13C412.6	2	1
R13C412	3	1

7.2.3.List of Courses and their Contribution towards Attainment of Program Outcomes and Program Specific Outcomes

Course code/Na	Course Outcome	Description	BTL	Connected POs	Connected PSOs
DCS R13C109	R13C409.1	Illustrate basic elements of digital control systems and its advantages	Analysis	1,2	2
	R13C409.2	Derive the mathematical modeling of a digital control system by applying z-transformations.	Application	1,2,3,12	
	R13C409.3	Analyze the state of the digital control system using States space	Analysis	1,2,12	2
	R13C409.4	Examine the stability analysis of discrete time systems.	Analysis	1,2	2
	R13C409.5	Interpret the design procedure of conventional method to analyze	Understanding	1,3,5,12	1,2
	R13C409.6	Describe the design procedure of state feedback controller by pole	Understanding	1,3,12	2
HVE R13C410	R13C410.1	To acquaint with the performance of high voltages with regard to different configurations of electrode	Knowledge / Rememberi	1,2,3,4,5,6, 10,12	2
	R13C410.2	Develop ability to understand theory of breakdown and withstand	Knowledge /	1,2,3,4,5,6, 10,12	
	R13C410.3	To acquaint with the techniques of generation of AC,DC and Impulse	Analysis/ Analyzing	1,2,3,4,5,6, 10,12	2
	R13C410.4	Emphasis the knowledge for measurement of high voltage and	Analysis/ Analyzing	1,2,3,4,5,6, 10,12	2
	R13C410.5	To be in a position to measure dielectric property of material used	Analysis/ Analyzing	1,2,3,4,5,6, 10,12	2
	R13C410.6	Attain the knowledge To the techniques of testing various	Analysis/ Analyzing	1,2,3,4,5,6, 10,12	2

EPQ R13C411	R13C411.1	Identify the Power Quality problems	Comprehension	1,2	
	R13C411.2	Describe the sources, protection of devices for voltages variations in	Application	1,2,3	
	R13C411.3	Discuss about the voltage regulation, power factor	Understanding	1,2,3	2
	R13C411.4	Analyze the harmonic distortions	Analysis	1,2,3,5	1
	R13C411.5	Demonstrate the relationship between Distributed generation	Application	1,2,6,7	
	R13C411.6	Explain the PQ monitoring concepts using measuring	Application	1,3,5	1
AI TECH R13C412	R13C412.1	Able to describe predicate logic, Learning Methods, Methods of AI Techniques	Comprehension/ Understand	1	2
	R13C412.2	Discover and interpret Biological and Artificial Neuron models,	Application / Applying	1	2
	R13C412.3	Able to design Multi-layer feed-forward network, RBF networks,	Application / Applying	1,2,3,5,6,9,11	1,2
	R13C412.4	Able to explain about Classical and Fuzzy sets and their relations	Application / Applying	1,2,3,4,5,6,9,11,12	1,2
	R13C412.5	Able to construct Fuzzification, Rules and Defuzzification to crip	Application / Applying	1,2,3,4,6,9,11	1
	R13C412.6	Able to apply Applications of AI techniques in Electrical and	Comprehension/	1,2,3,6,9,11,12	1

7.2.4. Attainment of courses- semester end

Course Code	Course Name	IntAtt (X_1)	Ext Att (X_2)	CO Learn Att (X_3)	Course Att	Remarks
R13C409	Digital Control Systems	3	3		3	
R13C410	Extra High Voltage Transmission	3	2		2.5	
R13C411	Electrical Power Quality	3	0		1.5	
R13C412	AI Techniques	2	3		2.5	
R13C413	Project	3	1		2	

7.3. Academic year End PO and PSO Attainment

7.3.1. PO Wise Direct Attainment, Observations and proposed actions for Continuous Improvement through Courses

PO NO	Courses Contributing PO			Target	Attainment	
	No of courses (year)	Course Code	Course Name		Subject wise	overall
PO1	1	R13C102	Mathematics-I		1.5	2.04
	2	R13C103	Mathematics – I(Mathematical Methods)		1	
	3	R13C104	Engineering Physics		1.5	
	4	R13C106	Engineering Drawing		3	
	5	R13C108	Engineering Physics Lab		1.5	
	6	R13C109	Engineering Physics – Virtual Labs		1.35	
	7	R13C110	Engg. Workshop& IT Workshop		1.5	
	8	R13C112	Mathematics – III		2.5	
	9	R13C113	Engineering Chemistry		1.5	
	10	R13C114	Engineering Mechanics		2.5	
	11	R13C115	Electrical Circuit Analysis-I		2	
	12	R13C116	Computer Programming		2.5	
	13	R13C117	Engineering Chemistry Lab		3	
	14	R13C119	C Programming Lab		3	

Engineering Knowledge : Applicable knowledge of mathematics, science, and electrical engineering to solve complex engineering problems

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO2						

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

Target Level	Attainment Level	Observations
2.00		

Action 1:						
PO3						

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

Target Level	Attainment Level	Observations
2.00		

Action 1:						
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.

Target Level	Attainment Level	Observations

	2.00				

Action 1:

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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.

Target Level	Attainment Level	Observations
2.00		

Action 1:

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

Target Level	Attainment Level	Observations
2.00		

Action 1:

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.

Target Level	Attainment Level	Observations
2.00		

Action 1:

PO8					

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO9

Individual and Team Work: Function effectively as an individual, and as a member or a leader in diverse teams, and in multidisciplinary settings.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

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.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PO12

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

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

7.3.2. PSO Direct Attainment, observations and proposed action for Continuous Improvement Through Courses

| PSO NO | PO Contributing Course | | | Targ et | Attainment | |
	No of course s (year) (x)	Course Code	Course Name		Subject wise	overall
PSO1	1	R13C102	Mathematics-I	1.5		
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					

Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO2						

Able to design and develop the Green Electrical systems.

Target Level	Attainment Level	Observations
2.00	2.5	

Action 1:

PSO1	1	R13C102	Mathematics-I	1.5		
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					

Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.

Target Level	Attainment Level	Observations
2.00	2.5	

PART-B
POs/PSOs ATTAINMENT

8. POs ATTAINMENT

8.1.Program Level Course Vs PO Matrices

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R16C101	-	2	-	1	-	1	1	1	2	3	1	1
R16C102	3	3	-	-	-	-	-	-	-	-	-	-
R16C103	3	3	-	-	-	-	-	-	-	-	-	-
R16C104	3	2	-	-	-	-	-	-	-	-	-	-
R16C105	-	-	-	-	-	1	-	3	2	-	-	-
R16C106	3	1	2	-	-	-	-	-	-	-	-	-
R16C107	-	-	-	-	-	-	-	-	3	3	3	-
R16C108	3	2	1	-	-	-	-	-	-	-	-	-
R16C109	3	2	-	-	-	-	-	-	-	-	-	-
R16C110	3	2	-	-	-	-	-	-	-	-	1	-
R16C111	-	2	-	1	-	1	1	1	2	3	1	1
R16C112	2	2	-	-	-	-	-	-	-	-	-	-
R16C113	3	1	1	-	-	-	-	-	-	-	-	-
R16C114	3	2	1	-	-	-	-	-	-	-	-	-
R16C115	2	3	1	-	-	-	-	-	-	-	-	-
R16C116	1	3	3	-	-	-	-	-	-	-	-	-
R16C117	2	1	-	-	-	-	-	-	-	-	-	-
R16C118	-	-	-	-	-	-	-	-	3	3	3	-
R16C119	1	3	3	-	-	-	-	-	-	-	-	-
R16C201	2	3	1	-	1	-	-	-	-	-	-	-
R16C202	3	3	2	-	-	-	-	-	-	-	-	-
R16C203	3	3	1	1	-	-	-	-	-	-	-	-
R16C204	3	3	-	-	-	-	-	-	-	-	-	-
R16C205	3	3	-	-	-	-	-	-	-	-	-	-
R16C206	1	2	2	2	1	1	1	-	-	-	-	-
R16C207	3	2	-	-	-	-	-	-	-	-	-	-
R16C208	1	2	-	3	-	-	-	-	2	-	-	-
R16C209	1	1	1	0	0	1	3	0	0	0	0	0
R16C210	2	3	3	-	-	-	-	-	-	-	-	-
R16C211	3	2	2	-	-	-	-	-	-	-	-	-
R16C212	1	2	2	-	-	1	1	-	-	-	-	-
R16C213	1	3	1	2	1	-	-	-	-	-	-	-
R16C214	2	3	1	-	1	-	-	-	-	-	-	-
R16C215	1	2	-	3	3	-	-	-	-	-	-	-
R16C216	3	3	2	-	-	-	-	-	-	-	-	-
R13C301	-	1	-	-	-	-	2	2	1	1	1	1
R13C302	2	3	1	-	-	-	-	-	-	-	-	-
R13C303	1	3	2	-	1	1	-	-	-	-	-	-
R13C304	1	3	3	2	1	0	0	0	0	0	0	0
R13C305	2	3	1	-	1	-	-	-	-	-	-	-
R13C306	2	2	3	3	-	-	-	-	-	-	-	-
R13C307	1	2	-	3	1	-	-	-	-	-	-	-
R13C308	-	2	-	3	-	-	-	-	1	-	-	-

R13C309	-	-	-	-	-	-	-	3	-	1	-	3
R13C310	1	3	2	-	-	1	-	-	-	-	-	-
R13C311	3	1	1	0	0	0	0	0	0	0	0	0
R13C312	1	3	1	-	-	1	1	-	-	-	-	-
R13C313	2	3	1	-	-	-	-	-	-	-	-	-
R13C314	1	3	-	-	1	-	-	-	-	-	-	-
R13C315	0	0	0	0	1	1	1	1	1	0	1	3
R13C316	-	2	-	3	1	-	-	-	1	-	-	-
R13C317	3	2	-	3	2	-	-	-	-	-	-	-
R13C401	1	1	3	2	1	-	2	-	-	3	2	3
R13C402	1	3	2	1	1	0	1	0	0	0	0	0
R13C403	3	1	3	0	0	0	0	0	0	0	0	0
R13C404	1	3	1	-	-	-	1	-	-	-	-	-
R13C405	3	3	-	-	-	-	-	-	-	-	-	-
R13C406	3	3	3	-	3	-	-	-	-	-	-	-
R13C407	-	2	-	3	2	-	-	-	-	-	-	-
R13C408	-	-	2	1	3	-	-	-	-	-	-	-
R13C409	1	2	2	1	1	-	-	-	-	-	-	-
R13C410	1	2	1	2	-	1	-	-	-	-	-	-
R13C411	1	3	2	-	2	0	0	0	0	0	0	0
R13C412	1	1	2	1	-	-	-	-	-	-	-	-
R13C413	2	1	-	1	1	-	-	-	2	1	1	-
No of courses	52+1	58+1	37	20+1	20+1	11	11	6	10+1	7+1	8+1	6
% of contribution	81.53%	90.76%	56.9%	32%	32%	16.9%	16.9%	9%	16.9%	12%	9%	12%

8.2. Program Level Direct Attainment

8.2.1. Direct Attainment through Courses

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
R16C101		1.5		1.5		1.5	1.5	1.5	1.5	1.5	1.5	1.5
R16C102	1.5	1.5										
R16C103	1	1										
R16C104	1.5	1.5										
R16C105						1.5		1.5	1.5			
R16C106	1.5	1.5	1.5									
R16C107									3	3	3	
R16C108	3	3	3									
R16C109	1.5	1.5										
R16C110	1.5	1.5									1.5	
R16C111		3		3		3	3	3	3	3	3	3
R16C112	2.5	2.5										
R16C113	1.5	1.5	1.5									
R16C114	2.5	2.5	2.5									
R16C115	2	2	2									
R16C116	2.5	2.5	2.5									
R16C117	3	3										

R16C118									3	3	3	
R16C119	3	3	3									
R16C201	1.5	1.5	1.5		1.5							
R16C202	1.5	1.5	1.5									
R16C203	1	1	1	1								
R16C204	1.5	1.5										
R16C205	1.5	1.5										
R16C206	1.5	1.5	1.5	1.5	1.5	1.5	1.5					
R16C207	3	3										
R16C208	3	3		3				3				
R16C209	1.5	1.5	1.5			1.5	1.5					
R16C210	1.5	1.5	1.5									
R16C211	1	1	1									
R16C212	1.5	1.5	1.5			1.5	1.5					
R16C213	1.5	1.5	1.5	1.5	1.5							
R16C214	1.5	1.5	1.5		1.5							
R16C215	3	3		3	3							
R16C216	3	3	3									
R13C301		3					3	3	3	3	3	3
R13C302	2.5	2.5	2.5									
R13C303	1.5	1.5	1.5			1.5	1.5					
R13C304	2.5	2.5	2.5	2.5	2.5							
R13C305	2	2	2		2							
R13C306	2.5	2.5	2.5	2.5								
R13C307	3	3		3	3							
R13C308		3		3				3				
R13C309							3		3			3
R13C310	3	3	3			3						
R13C311	2.5	2.5	2.5									
R13C312	1.5	1.5	1.5			1.5	1.5					
R13C313	2.5	2.5	2.5									
R13C314	2	2			2							
R13C315					2.5	2.5	2.5	2.5	2.5		2.5	2.5
R13C316		3		3	3				3			
R13C317	3	3		3	3							
R13C401	2.5	2.5	2.5	2.5	2.5		2.5			2.5	2.5	2.5
R13C402	2.5	2.5	2.5	2.5	2.5		2.5					
R13C403	2.5	2.5	2.5									
R13C404	2.5	2.5	2.5				2.5					
R13C405	2.5	2.5										
R13C406	3	3	3		3							
R13C407		3		3	3							
R13C408			3	3	3							
R13C409	2.5	2.5	2.5	2.5	2.5							
R13C410	2.5	2.5	2.5	2.5		2.5						
R13C411	2.5	2.5	2.5		2.5							
R13C412	2.5	2.5	2.5	2.5								
R13C413												

8.2.4. Direct Attainment through Activities

8.2.4.3.Direct Attainment through Activities

Activity	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Guest Lecturers								3
Add-on Courses	0							0
Projects Exhibition	2	2			2			2
Paper Presentations	2					2		
NSS Activities		3			3			
Program on Environment\ sustainability			2					
Programs on Ethics		0		0				
Ethical Practices – Like HonestyShops, Yoga, etc.,		2		2				
Project Management & FinanceGuest Lecturers							0	
Library, Internet Hours								3
Student Seminar &EnglishCommunication Hours						0		
Entrepreneurships – Lecturers							2	
Students Qualification in English certificatation / communication		0						
Programs on Health or Course on Human Anatomy		2						
Programs on Safety Engineering		2						
Programs on Intellectual Property Rights		0					0	
Programs on Business Laws		0					0	
Cultural Events, Activities		3			2			
Industry Internships								
Industry Visits								

8.3. Program Level Indirect Attainment

8.3.1. Exit Survey

Exit Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2.5	2.3	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.3

8.3.2.Alumni Survey

Alumni Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2.5	2.3	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.3

8.3.3. Industry Survey

Industry	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

Survey	2.5	2.3	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.3

8.3.4. Internship Survey

Industry Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2.5	2.3	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.3

8.3.5. Employer Survey

Industry Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2.5	2.3	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.3

8.3.6. Parent Survey

Parent Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	2.5	2.3	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.4	2.5	2.3

8.4. PO wise Attainment, Observations and proposed action for continuous improvement.
8.4.1.POS HAVING LESS THAN 50% CONTRIBUTION

PO1Attainment

Assessment method	Year		Courses contributing	Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				

		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.31	1.74	80%	1.3635	
		II	1.28				
		III	1.84				
		IV	2.53				
Indirect	Exit feedback			2.2	5%	0.11	0.4665
	Alumni feedback			2.76	5%	0.138	
	Industry /Internship/employee feedback			1.75	5%	0.0875	
	Parent Feedback			2.62	5%	0.131	
PO Attainment						**1.82**	

Observations and Proposed Action for Continuous Improvement

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

	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

PO2Attainment

Assessment method	Year	Courses contributing			Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101				
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
	II	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
	III	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
	IV	1					
		2					

	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.31	1.74	80%	1.3635	
		II	1.28				
		III	1.84				
		IV	2.53				
Indirect	Exit feedback			2.2	5%	0.11	0.4665
	Alumni feedback			2.76	5%	0.138	
	Industry /Internship/employee feedback			1.75	5%	0.0875	
	Parent Feedback			2.62	5%	0.131	
PO Attainment						**1.82**	

Observations and Proposed Action for Continuous Improvement

PO2	**Problem Analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching sustained conclusions using first principles of mathematics, natural sciences, and engineering sciences.		
	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

PO3Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				

		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution
Direct	Through courses	I	1.31	1.74	80%	1.3635
		II	1.28			
		III	1.84			
		IV	2.53			
Indirect	Exit feedback		2.2	5%	0.11	0.4665
	Alumni feedback		2.76	5%	0.138	
	Industry /Internship/employee feedback		1.75	5%	0.0875	
	Parent Feedback		2.62	5%	0.131	
PO Attainment						**1.82**

Observations and Proposed Action for Continuous Improvement

PO3	**Design/Development of Solutions**: Design solutions for complex engineering problems and design system components or process that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.		
	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

PO4Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

		11					
		12					
		13					
	IV	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.31	1.74	80%	1.3635	
		II	1.28				
		III	1.84				
		IV	2.53				
Indirect	Exit feedback			2.2	5%	0.11	0.4665
	Alumni feedback			2.76	5%	0.138	
	Industry /Internship/employee feedback			1.75	5%	0.0875	
	Parent Feedback			2.62	5%	0.131	
PO Attainment						**1.82**	

Observations and Proposed Action for Continuous Improvement

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.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

PO5   Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				

Direct		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution
Direct	Through courses	I	1.31	1.74	80%	1.3635
		II	1.28			
		III	1.84			
		IV	2.53			

Indirect	Exit feedback	2.2	5%	0.11	0.4665
	Alumni feedback	2.76	5%	0.138	
	Industry /Internship/employee feedback	1.75	5%	0.0875	
	Parent Feedback	2.62	5%	0.131	
PO Attainment					**1.82**

Observations and Proposed Action for Continuous Improvement

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.	
	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

PO6Attainment

Assessment method	**Year**	**Courses contributing**		**Target**	**Subject wise Attainment**	**Year wise attainment**
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				

		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.31	1.74	80%	1.3635	
		II	1.28				
		III	1.84				
		IV	2.53				
Indirect	Exit feedback			2.2	5%	0.11	0.4665
	Alumni feedback			2.76	5%	0.138	
	Industry /Internship/employee feedback			1.75	5%	0.0875	
	Parent Feedback			2.62	5%	0.131	
PO Attainment						**1.82**	

Observations and Proposed Action for Continuous Improvement

PO6	**The Engineer and Society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

8.4.2. POS HAVING LESS THAN 50% CONTRIBUTION

PO7Attainment

Assessme	Year	Courses contributing	Targ	Subject	Year wise

nt method					et	wise Attainment	attainment
Direct Through Courses	I	1	R13C101				
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
	II	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
	III	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
	IV	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
Assessment method	No of	Courses contributing to PO			Attainment		
		Activity name			Individual		Total

	Activity			
Direct Through Activities	1	Programs on Ethics(Co-Curricular)	0	4
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)		

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities			1.9	20%	0.38	
Indirect	Exit feedback			2.5	5%	0.125	0.46
	Alumni feedback			2.54	5%	0.127	
	Industry /employee feedback			2	5%	0.1	
	Parent Feedback			2.11	5%	0.1055	
PO Attainment						**1.74**	

Observations and Proposed Action for Continuous Improvement

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.		
	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

PO8Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				

	II	1						
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
	III	1						
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
	IV	1						
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						

Assessment method	No of Activity	Courses contributing to PO	Attainment	
		Activity name	Individual	Total
Direct Through Activities	1	Programs on Ethics(Co-Curricular)	0	4
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)		

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities			1.9	20%	0.38	
Indirect	Exit feedback			2.5	5%	0.125	0.46
	Alumni feedback			2.54	5%	0.127	

Industry /employee feedback	2	5%	0.1
Parent Feedback	2.11	5%	0.1055
PO Attainment			**1.74**

Observations and Proposed Action for Continuous Improvement

PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

PO9Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				

		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

Assessment method	Courses contributing to PO		Attainment	
	No of Activity	Activity name	Individual	Total
Direct Through Activities	1	Programs on Ethics(Co-Curricular)	0	4
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)		

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities		1.9	20%	0.38		
Indirect	Exit feedback		2.5	5%	0.125	0.46	
	Alumni feedback		2.54	5%	0.127		
	Industry /employee feedback		2	5%	0.1		
	Parent Feedback		2.11	5%	0.1055		
PO Attainment						**1.74**	

Observations and Proposed Action for Continuous Improvement

PO9	**Individual and Team Work**: Function effectively as an individual, and as a member or a leader in diverse teams, and in multidisciplinary settings.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

PO10Attainment

Assessment method	Year		Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101				
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
	II	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
	III	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
	IV	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					

	9				
	10				

Assessment method	No of Activity	Courses contributing to PO		Attainment	
		Activity name		Individual	Total
Direct Through Activities	1	Programs on Ethics(Co-Curricular)		0	4
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)			

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities			1.9	20%	0.38	
Indirect	Exit feedback			2.5	5%	0.125	0.46
	Alumni feedback			2.54	5%	0.127	
	Industry /employee feedback			2	5%	0.1	
	Parent Feedback			2.11	5%	0.1055	
PO Attainment						**1.74**	

Observations and Proposed Action for Continuous Improvement

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.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

PO11Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				

		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

Assessment method	No of Activity	Courses contributing to PO	Attainment	
		Activity name	Individual	Total
Direct Through Activities	1	Programs on Ethics(Co-Curricular)	0	4
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)		

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities			1.9	20%	0.38	
Indirect	Exit feedback			2.5	5%	0.125	0.46
	Alumni feedback			2.54	5%	0.127	
	Industry /employee feedback			2	5%	0.1	
	Parent Feedback			2.11	5%	0.1055	
PO Attainment						**1.74**	

Observations and Proposed Action for Continuous Improvement

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.	
	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

PO12 Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				

		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

Assessment method	No of Activity	Courses contributing to PO	Attainment	
		Activity name	Individual	Total
Direct Through Activities	1	Programs on Ethics(Co-Curricular)	0	4
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)		

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities		1.9		20%	0.38	
Indirect	Exit feedback			2.5	5%	0.125	0.46
	Alumni feedback			2.54	5%	0.127	
	Industry /employee feedback			2	5%	0.1	
	Parent Feedback			2.11	5%	0.1055	
PO Attainment						**1.74**	

Observations and Proposed Action for Continuous Improvement

PO12	**Life- Long Learning**: Recognize the need for, and have the preparation and ability to engage in independent and life- long learning in broadest context of technological change.		
	Target Level	Attainment Level	Observations
	2.00	2.5	
Action 1:			

9.PSOs ATTAINMENT

9.1. Program Level Course Vs PSO Matrices

Course	PSO1	PSO2
R16C101	1	-
R16C102	-	-
R16C103	-	-
R16C104	-	1
R16C105	-	1
R16C106	6	2
R16C107	1	-
R16C108	-	1
R16C109	-	1
R16C110	-	-
R16C111	1	-
R16C112	-	-
R16C113	1	1
R16C114	-	1
R16C115	2	1
R16C116	-	-
R16C117	1	1
R16C118	1	-
R16C119	-	-
R16C201	2	-
R16C202	-	-
R16C203	3	-
R16C204	3	-
R16C205	-	3
R16C206	1	2
R16C207	-	-
R16C208	-	2
R16C209	-	1
R16C210	2	-
R16C211	-	-
R16C212	-	1
R16C213	2	-
R16C214	2	-
R16C215	1	2
R16C216	3	3
R13C301	-	-

R13C302	-	-
R13C303	1	1
R13C304	3	1
R13C305	1	-
R13C306	3	3
R13C307	1	-
R13C308	1	-
R13C309	-	-
R13C310	1	1
R13C311	3	-
R13C312	-	1
R13C313	2	-
R13C314	1	3
R13C315	-	-
R13C316	2	-
R13C317	3	-
R13C401	2	3
R13C402	2	2
R13C403	2	3
R13C404	-	2
R13C405	3	1
R13C406	3	1
R13C407	3	-
R13C408	3	2
R13C409	1	-
R13C410	-	1
R13C411	3	1
R13C412	3	-
R13C413	3	2
No of courses		
% of contribution		

9.2. Program Level Direct Attainment

9.2.1. Direct Attainment through Courses

CO	PSO1	PSO2
R16C101	**1.5**	
R16C102		
R16C103		
R16C104		**1.5**
R16C105		**1.5**
R16C106		**1.5**
R16C107	**3**	
R16C108		**3**
R16C109		**1.5**
R16C110		
R16C111	**3**	
R16C112		
R16C113	**1.5**	**1.5**
R16C114		**2.5**

R16C115	2	2
R16C116		
R16C117	3	3
R16C118	3	
R16C119		
R16C201	1.5	
R16C202		
R16C203	1	
R16C204	1.5	
R16C205		1.5
R16C206	1.5	1.5
R16C207		
R16C208		3
R16C209		1.5
R16C210	1.5	
R16C211		
R16C212		1.5
R16C213	1.5	
R16C214	1.5	
R16C215	3	3
R16C216	3	3
R13C301		
R13C302		
R13C303	1.5	1.5
R13C304	2.5	2.5
R13C305	2	
R13C306	2.5	2.5
R13C307	3	
R13C308	3	
R13C309		
R13C310	3	3
R13C311	2.5	
R13C312		1.5
R13C313	2.5	
R13C314	2	2
R13C315		
R13C316	3	
R13C317	3	
R13C401	2.5	2.5
R13C402	2.5	2.5
R13C403	2.5	2.5
R13C404		2.5
R13C405	2.5	2.5
R13C406	3	3
R13C407	3	
R13C408	3	3
R13C409	2.5	
R13C410		2.5
R13C411	2.5	2.5
R13C412	2.5	

9.3. Program Level Indirect Attainment

9.3.1. Exit Survey

Exit Survey	PSO1	PSO2
	2.5	2.3

9.3.2.Alumni Survey

Alumni Survey	PSO1	PSO2
	2.5	2.3

9.3.3. Industry Survey

Industry Survey	PSO1	PSO2
	2.5	2.3

9.3.4. Internship Survey

Internship Survey	PSO1	PSO2
	2.5	2.3

9.3.5. Employer Survey

Industry Survey	PSO1	PSO2
	2.5	2.3

9.3.6. Parent Survey

Parent Survey	PSO1	PSO2
	2.5	2.3

9.4.PSO WISE ATTAINMENT AND IMPROVEMENT

9.4.1. PSOs Having More Than 50% Contribution
PSO1Attainment

Assessment method	Year	Courses contributing		Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101			
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				

		10				
		11				
		12				
		13				
		14				
	II	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
	III	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
	IV	1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.31	1.74	80%	1.3635	
		II	1.28				
		III	1.84				
		IV	2.53				
Indirect	Exit feedback			2.2	5%	0.11	0.4665
	Alumni feedback			2.76	5%	0.138	
	Industry /Internship/employee feedback			1.75	5%	0.0875	

Parent Feedback	2.62	5%	0.131	
PO Attainment			**1.82**	

Observations and Proposed Action for Continuous Improvement

PSO1	Ability to design solutions for identified problems by using latest engineering tools like MATLAB, Simulink, PSPICE, plc etc.		
	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

9.4.2. PSOs Having Less Than 50% Contribution
PSO2Attainment

Assessment method	Year	Courses contributing			Target	Subject wise Attainment	Year wise attainment
Direct Through Courses	I	1	R13C101				
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
	II	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
	III	1					
		2					
		3					

		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
	IV	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					

		Courses contributing to PO		Attainment	
Assessment method	**No of Activity**	**Activity name**	**Individual**	**Total**	
Direct Through Activities	1	Programs on Ethics(Co-Curricular)	0	4	
	2	Ethical Practices – Like Honesty Shops, Yoga, etc.,(Extra-Curricular)			

S No	Assessment method	Year	Year End Attainment	Overall attainment	Assessment weightage	End Contribution	
Direct	Through courses	I	1.87	1.49	60%	0.85	1.274
		II	0.64				
		III	1.31				
		IV	1.56				
	Activities			1.9	20%	0.38	
Indirect	Exit feedback			2.5	5%	0.125	0.46
	Alumni feedback			2.54	5%	0.127	
	Industry /employee feedback			2	5%	0.1	
	Parent Feedback			2.11	5%	0.1055	
PO Attainment						**1.74**	

Observations and Proposed Action for Continuous Improvement

	.		
PSO2	Target Level	Attainment Level	Observations
	2.00	2.5	

Action 1:

ANNEXURES

Annexure -I

Co assesssment Sample for a subject

R13C214
Electrical circuit Analysis-II

Set Target %							50					
Attainment Level 1							60% Students scoring more than 50% marks out of relevant maximum marks					
Attainment Level 2							70% Students scoring more than 50% marks out of relevant maximum marks					
Attainment Level 3							80% Students scoring more than 50% marks out of relevant maximum marks					

COURSE ATTAINMENT(X1*0.4 + X2*0.4+X3*0.2)

INTERNAL ATTAINMENT (X1)						EXTERNAL ATTAINMENT (X2)	COURSE OUTCOME LEARNING (X3)					
R13C402.1	R13C402.2	R13C402.3	0	0	0		R13C402.1	R13C402.2	R13C4023	0	0	0
3	0	3	3	3	3		2	1	3	2	2	1
30%	30%	10%	10%	10%	10%		30%	30%	10%	10%	10%	10%
0.9	0	0.3	0.3	0.3	0.3		0.6	0.3	0.3	0.2	0.2	0.1
2.1						1	1.7					

1.6

COURSE END AVERAGE MARKS		59.4

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
1.6	1.6	1.6	1.6					1.6			1.6	1.6	1.6		

Annexure -II

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
GANGURU::VIJAYAWADA – 521 139
Course Outcome Attainment Analysis

Name of the Program   : B.Tech in Electrical Engineering   Academic Year: 2016-17
Year & Semester : II Year II Semester Section: A   No of Credits   : 03
Name of the Course : Control Systems   Code : R13C214
Course : Core   Regulation : R13
Course Area/Module : Control Systems   No of students registered : 62
Name of the Faculty : Mr. V.Bordu   Designation: Asst Professor

Course outcome :

Target% :   65%
Attainment level 1:   60% Students scoring more than 65% marks out of relevant maximum marks
Attainment level 2:   70% Students scoring more than 65% marks out of relevant maximum marks
Attainment level 3:   80% Students scoring more than 65% marks out of relevant maximum marks

Course Outcome no.: R13C214.1
Attainment Level at the End of Day to Day Assessment   : 3 (88%)
Are you Satisfied with Student Performance   : Yes

Course Outcome no.: R13C214.2
Attainment Level at the End of Day to Day Assessment   : 2 (75%)
Are you satisfied with Student Performance   : No
If Not, What is the Remedial/Corrective Action Planned?
1. Remedial class has be planned for weak students

Course Outcome no.: R13C214.3
Attainment Level at the End of Day to Day Assessment   : 3 (89.92%)
Are you satisfied with Student Performance   : Yes

Course Outcome no.: R13C214.4
Attainment Level at the End of Day to Day Assessment   : 3 (81)
Are you satisfied with Student Performance   : Yes

Course Outcome no.: R13C214.5
Attainment Level at the End of Day to Day Assessment   : 3.8
Are you satisfied with Student Performance   : No

If Not, What is the Remedial/Corrective Action Planned?
1.   Conducted tutorial session and more prob lems are solved on compensating networks
2.   Two remedial classes are planned on Unit-V to concentrate on weak students to improve their performance

Course Outcome no.: R13C214.6

Attainment Level at the End of Day to Day Assessment   : 1 (63)
Are you satisfied with Student Performance   : No
If Not, What is the Remedial/Corrective Action Planned?
1. Conducted tutorial session and explained different techniques in brief

Annexure -III

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
Course End Suggestions

Name of the Program   : B.Tech in Electrical Engineering   Academic Year: 2016-17
Year & Semester : II Year II Semester Section: A   No of Credits   : 03
Name of the Course : Control Systems   Code : R13C214
Course : Core   Regulation : R13
Course Area/Module : Control Systems   No of students registered : 62
Name of the Faculty : Mrs.V.Bindu   Designation: Asst.Professor

➢ R13C214.1 deals with calculation of transfer function for physical system. As it is an introductory outcome it needs more explanation by considering more examples. It is a fundamental outcome for the next outcomes so concentrate more on this outcome.

➢ R13C214.2 helps more in the competitive exam point of view. So prepare students for both descriptive and competitive exam by explaining easy method of calculation of transfer function.

➢ R13C214.3 is an easy and scoring outcome if student knows the procedure for calculation of stability by using Routh's criteria and root locus. So concentrate more in explaining procedures.

➢ R13C214.4 deals with boded, polar, Nyquist plots which explains stability. This unit requires more no. of hours so plan accordingly.

➢ R13C214.5 analyses the different types of controllers used in order to maintain the system stable. Controller design help students while doing projects.

➢ R13C214.6 is the base for the advanced subjects like ACS, DCS etc.

Annexure -IV

CO LEARNING ASSESSMENT SAMPLE

Name of the Programme:

Name of the student: Roll No:

year: Sem

Please rank the following questions with justifications using 3 point scale.

5: Excellent   **4**: Very Good **3**: Good   **2**: Satisfactory **1**: Poor

Are you able to

SNO	Description	1	2	3	2	1	Justification
1	Summarize transient responses of first, second order systems						
2	Apply concept of Fourier and Laplace transforms to electrical circuits						
3	Determine parameters of two port networks						
4	Synthesize positiveness of a real function						
5	Realize elements from a given transfer function						
6	Analyze three phase systems under balanced and unbalanced conditions						
7	Perform frequency, time domain analysis of linear circuits						

Signature of student

Date

Annexure -V

EXIT FEED BACK

Name of the Programme:

Name of the student: Roll No:

Passed out year: Gender: Male / Female

Please rank the following questions with justifications using 3 point scale.

 3: Very Good   **2**: Good   **1**: Satisfactory

FEED BACK ON PROGRAM OUTCOMES
Did the Programme provided you

PO	Description	3	2	1	Justification
PO1	Applicable knowledge of mathematics, science, and electricalengineeringtosolve complex engineering problems				
PO2	Capability to identify, formulate, investigate and synthesis of information to solve complex engineering problems				
PO3	Getting an idea to design solutions for complex system, component, or process with defined needs to meet public health & safety considerations.				
PO4	Capacity to investigate, conduct experiments, perform analysis and interpret data for complex engineering problems				
PO5	Knowledge to use appropriate techniques, skills, and modern tools to predict and design various engineering activities.				
PO6	Having capability toanalyze the impact of global and contemporary issues relevant to professional engineering practice				
PO7	Ability to understand the affect of professional engineering solutions in environmental contexts for sustainable development.				
PO8	Professional and ethical attitude to execute the given responsibilities				
PO9	Capacity to function effectively as an individual, and as a memberor leader in diverse teams				
PO10	Knowledge in communicative,writing skills to encode and decode clear instructions regarding variouscomplex engineering activities				
PO11	Applicable knowledge of engineering and management principles to manage projects in multi disciplinary environment.				
PO12	Appropriate preparation and ability to engage life long learning in the broadest context of technological change				

Annexure -VI

FEED BACK ON PROGRAM SPECIFIC OUTCOMES

Does the Programme provide you

PSO	Description	3	2	1	Justification
PSo1	Appropriate knowledge to make effective design solutions to identify problemsbyusinglatest engineering tools like MATLAB, Simulink, PSPICE, plc etc				
PSo2	Applicable knowledge to design and develop Green Electrical systems				

Please specify any suggestions for improvement which should meet the department vision

Signature of student
Date:

Annexure -VII

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Electrical and Electronics Engineering

FEEDBACK FROM ALUMNI

Dear Alumni

We are glad that you have spent four valuable years for B.Tech. Course in DIET. We would like to place on record that your co-operation and support have contributed in no small measure for this achievement.

We shall very much appreciate and be thankful, if you spare some of your valuable time to fill up this feedback form and give us your valuable suggestions for further improvement of the Institute.

 Name of the Program:

Please rate for the following attributes	3	2	1	Justification

Name of the student: D.O.B: Roll No:

Passed out year: Gender: Male / Female

Communication Details for future contact:

Phone No:

E-Mail ID:

Address:

1. What was your initial position in professional career?

2. What is your current position at your employment?

3. Have you pursued any higher education? If so give details.

4. Did you learn any new technologies/ tools other than those learnt during your graduation to meet the current job requirements?

5. Are you a student member of IEEE or any other professional body?   **YES / NO**
   Professional body name:

6. Please answer all questions using a 3 point scale
   3: Excellent   **2**: Very good   **1**: Satisfactory

1	Now are you able to imply and analyze a problem assigned to you by using the knowledge gained during the Program?				
2	Provided Training/Career Guidance Programs in DIET are useful to you now.				
3	Are you able to apply recent tools to justify the impact in problem solution which you learnt in your Program?				
4	Have you got encouragement by participating Co-curricular/Extra Curricular (workshops//NSS/Sports)?				
5	Up to what extent Laboratory, Library facilities enhanced your learning capability in aspects of engineering trends.				
6	How do you rate the recent developments in DIET?				
7	Did you acquire Knowledge regarding Environmental Sustainability during the course?				
8	Activities of department wise Alumni associations step in the right direction.				
9	Did DIET Activities enrich your ability of life long learning Skills?				
10.	The department administration should take initiative to efficiently enroll and strengthen the alumni-association.				

11. Do you suggest any modifications in the theory/ practical courses in the curriculum?

12. Please provide your valuable comments and suggestions for further improvement:-

Signature of Alumni

Annexure -VIII

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
INDUSTRIAL VISIT FEEDBACK

1. Industry Profile:

2. Name of the Industry :Address of Industry:

3. Name of Department Person :Mobile No.: Office No.:

4. Email:Type of Industry:

5. Which part of the syllabus covered in this visit?

6.Is DIET / JNTU University syllabus matching to your industrial requirements? Yes / No

7. Suggests changes to be incorporated in the syllabus:

8.Would you like to help in academic/ innovative activities of this institute? Yes/ No

Please rank the following questions with justifications using 3 point scale.

3: Excellent   **4**: Very Good **3**: Satisfactory

Sno	Description	3	2	1
1	Did students have Capacity for development and analysis of engineering problems and formulation of appropriate solutions, retaining professional and ethical responsibilities.			
2	Did students Provided Competence for acquiring new skills and applying them in research and development			
3	Did students have ability to learn new skills and a clear appreciation for the value of lifelong learning to update professional knowledge			
4	Did students have knowledge in understanding professional engineering solutions for sustainable development and their application in global, national, and societal contexts.			
5	Did student shave capability in differentiation of management techniques and possession of leadership skills that enable successful function of multi disciplinary teams			
6	Did students provide professional fluency both in communicative and technical forms			

9. Are you willing to visit DIET for Academic interactions? Yes / No

10. Placement / Training: Would you like to implant training to DIET students? Yes / No

11. Would you like to be an INDUSTRY member of this institute? Yes/ No

Any other Suggestions:

Signature

Annexure -IX

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
EMPLOYER FEEDBACK

Name of the graduate:

Employer details: Type of industry:

Name of the contact person: Mobile number:

email: Employed since:

Please rank the following questions with justifications using 3 point scale.

3: Excellent   **4**: Very Good **3**:   Satisfactory

Sno	Description	3	2	1
1	Capacity for development and analysis of engineering problems and formulation ofappropriate solutions from engineering knowledge			
2	Aptitude for self-education, ability to learn new skills and a clear appreciation for the value of lifelong learning to update professional knowledge			
3	To what extent our graduate can apply his knowledge for design /development of complex problem technical solution			
4	How good our graduate is active in professional and service oriented activities.			
5	To what extent you think our graduates can analyses and demonstrate the knowledge of environment and sustainability.			
6	To what extent you believe that our graduate committed to the ethical practices of your organization.			
7	Is our graduate equally capable of working as an individual or as a team member?			
8	How good our graduate communicates with the management team and clients.			
9	How good our graduate in management of projects, activity at your organization.			
10	How good our curriculum is relevant to the industrial requirements in enhancing the graduate skills.			
11	Do you allow our students for internships or in plant trainings?			
12	Do you continue to plan our graduates in your organization?			

Additional suggestions to improve ourselves towards Industry requirements

                                                              Signature of Employer
                                                              Date

Annexure -X

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY

INTERNSHIP FEED BACK FORM

12. Industry Profile :

13. Name of the Industry

14. Address of Industry:

15. Name of Trainer :   Mobile No.:Office No.:

16. Email:

17. Type of Industry:

18. Attendance % :No. of Days Worked:No. of Days absent:

19. Nature of work / duty done:

Please rank the following questions with justifications using 3 point scale.

   3: Excellent   **4**: Very Good **3**: Satisfactory

Sno	Description	3	2	1
1	Did you feel that our student can arrive desired solutions to meet industry requirements			
2	Did our students Provided Competence for acquiring new skills andapplying them in research and development			
3	Did students have knowledge in understanding professional engineering solutions for sustainable development and their application in global, national and societal contexts.			
4	How best our students communicated with industry personal to enhance their knowledge levels			
5	Did students havecapability in differentiation of management techniques and possession of leadership skills that enable successful function of multidisciplinaryteams			
6	Did students maintained ethical values while working individually or in a group			

20. In case of vacancy are you willing to provide employment? Yes/No

21. Any other Suggestions:

                                                               Signature:
                                                               Date

Annexure -XI

FEEDBACK FROM PARENT

Dear Parent,

We request you to provide your feedback for teaching and learning process based on your son/daughter's performance. Your valuable feedback will help our EEE department to improve our further process.

Regd. No:

Name of the Student:

Name of the Parent:

Address:

Year of Passing out:

Contact Number:

E- Mail ID:

How our Institution satisfied your child's requirements during his/her studies. please fill the questions?

Points: -   1: Low   2: Medium   3: High

S.No	Program Outcomes (POs)	1	2	3	Remarks
1	DIET follows excellent academic standards				
2	How much is your ward capable to analyze designing the things related to Electrical Engineering?				
3	The institution provides the best environment for learning				
4	Quality of Academic Resources namely Teachers, course material etc				
5	Rate the quality of infrastructure namely laboratory, facilitated learning of curriculum-based software development tools.				
6	Have the encouragement to Co-Curricular And Extra-Curricular Activities Aided in Overall Gromming And Personality				
7	Provided Training/workshops andCareer Guidance Programs in DIET are useful to your ward				
8	How do you rate library, hostel , administrative and examination facilities.				
9	Do you feel student counseling and mentoring help including moral and ethical values among the students				
10	The institute's focuses on student welfare, providing a safe and caring environment are excellent				
11	Does Your ward have comfort while speaking in a large group				
12	How well is he/she able to handle his/her work and financial matters?				
13	How much is he/she interested in learning new things?				

14	How was your child's development regarding studies during these 4 years of Degree				
15	Would you recommend this institution to another parent?				

Any other Feedback that you want to give to the college:

Signature of the Parent

Annexure –XII

PROJECT RUBRIC SAMPLE

Review	Agenda	Assessment	Review weightage	Overall weightage

Review 1	Project Synopsis/ Proposal Evaluation (First Term)	Rubric R1	20 marks	10 %
Review 2	Second-Term Project Evaluation	Rubric R2	30 Marks	15%
Project Report Verification		Rubric R3	10 Marks	5%
External Evaluation			140 Marks	70%
Total			200 Marks	100%

Rubric R1: Project Synopsis/ Proposal EvaluationMarks: 20Maximum

	Excellent (5)	Good (4)	Average (3)	Acceptable (2)	Unacceptable (1)
Identification of Problem Domain and Detailed Analysis	Detailed and extensive explanation of the purpose and need of the project	Good explanation of the purpose and need of the project	Average explanation of the purpose and need of the project;	Moderate explanation of thepurpose and need of the project	Minimal explanation ofthe purpose and need of the project
	Excellent (10)	**Good (09)**	**Average (08)**	**Acceptable (07)**	**Unacceptable (06)**
Study of the Existing Systems and Feasibility of Project Proposal	Detailed and extensive explanation of the specifications and the limitations ofthe existing systems	Collects a great deal of information and good study of the existing systems	Moderate study of the existing systems; collects some basic information	Explanation of the specifications and the limitations ofthe existing systems not very satisfactory; limited information	Minimal explanation of the specifications and the limitations of the existing systems; incomplete information
	Excellent (5)	**Good (4)**	**Average (3)**	**Acceptable (2)**	**Unacceptable (1)**
Objectives and methodology of the Proposed Work	All objectives ofthe proposed work are well defined; Steps to be followed tosolve the defined problem are clearly	Good justification to the objectives; methodology to befollowed is specified but detailing is not done	Incomplete justification to the objectives proposed; Steps are mentioned but unclear; without justification toobjectives	Only Some objectives ofthe proposed work are well defined; Steps to be followed to solve the defined problem are not specified	Objectives of the proposed work are either not identified or not well defined; Incomplete and improper specification

Rubric R2: Second-term Project EvaluationMaximum Marks: 30

	Excellent (10)	Good (9)	Average (8)	Acceptable (7)	Unacceptable
Results	Results are presented invery appropriatemanner	Results are presented in good manner	Results presented are not much satisfactory	Results presented are not much satisfactory	Results are notpresented properly
	Excellent (5)	**Good (4)**	**Average (3)**	**Acceptable (2)**	**Unacceptable**
Conclusions and Discussions	Project work iswell summarized and concluded	Project work summary and conclusion not very appropriate	Project work summary and conclusion notvery appropriate	Project work summary and conclusion not veryappropriate	Project work is not summarized and concluded
	Excellent (5)	**Good (4)**	**Average (3)**	**Acceptable (2)**	**Unacceptable**
Scope for further study	Future extensions in the project are well specified	Future extensionsin the project arespecified	Future extensions in the project arespecified	Future extensions in the project are not specified	Future extensions in the project are not specified
	Excellent (10)	**Good (9)**	**Average (8)**	**Acceptable (7)**	**Unacceptable**
Presentation	Contents of presentations are appropriate and well delivered Proper eye contact with audience and clear voice with good spoken language	Contents of Presentations are appropriate and well delivered Clear voice with good spoken language but less eye contact with audience	Contents of Presentations are appropriate but not well delivered Eye contact with few people and unclear voice	Contents of Presentations are not appropriate ☐ Eye contact with few people and unclear voice	Contents of presentations are not appropriate and not well delivered ☐ Poor delivery of presentation

Final Document VerificationMaximum Marks: 10

	Excellent (5)	Good (4)	Average (3)	Acceptable (2)	Unacceptable (1)

				Project report is not fully according to the specified format	Project report not prepared according to the specified format
Project Report	Project report is according to the specified format References and citations are appropriate and well mentioned	Project report is according to the specified format References and citations are appropriate but not mentioned well	Project report is according to the specified format but some mistakes □ In-sufficient references and citations	□ Insufficient references and citations	□ References and citations are not appropriate
	Excellent (5)	**Good (4)**	**Average (3)**	**Acceptable (2)**	**Unacceptable (1)**
Description of Concepts and technical Details	Complete explanation of the key concepts Strong description of the technical requirements of the project	Complete explanation of the key concepts In-sufficient description of the technical requirements of the project	Complete explanation of the key concepts but little relevance to literature In-sufficient description of the technical requirements of the project	All key concepts are not explained and very little relevance to literature. □ Insufficient description of the technical requirements of the project	Inappropriate explanation of the key concepts Poor description of the technical requirements of the project

External evaluation Marks:140

	Excellent (50)	**Good (40)**	**Average (30)**	**Acceptable (20)**	**Unacceptable (10)**
Project Report	Project report is according to the specified format References and citations are appropriate and well mentioned	Project report is according to the specified format References and citations are appropriate but not mentioned well	Project report is according to the specified format but some mistakes □ In-sufficient references and citations	Project report is not fully according to the specified format □ Insufficient references and citations	Project report not prepared according to the specified format □ References and citations are not appropriate

	Excellent (50)	Good (40)	Average (30)	Acceptable (20)	Unacceptable (10)
Presentation	Contents of presentations are appropriate and well delivered Proper eye contact with audience and clear voice with good spoken language	Contents of Presentations are appropriate and well delivered Clear voice with good spoken language but less eye contact with audience	Contents of Presentations are appropriate but not well delivered Eye contact with few people and unclear voice	Contents of Presentations are not appropriate ☐ Eye contact with few people and unclear voice	Contents of presentations are not appropriate and not well delivered ☐ Poor delivery of presentation
	Excellent (40)	**Good (30)**	**Average (20)**	**Acceptable (10)**	**Unacceptable (05)**
Viva-Voce	Complete explanation and answering concepts	In-sufficient description and answering concepts	In-sufficient description and answers little irrelevant	In-sufficient description and answers little irrelevant and unable to recollect the data	Poor delivery or explanation

Annexure –XIII

SEMINAR RUBRIC SAMPLE

D	C	B	A
20	35-20	35-45	45-50

Evaluate the student's research presentation employing the following range-scored criteria (best is on right)					
	Inadequate	Average	Admirable	Outstanding	
Knowledge and Content	1	2	3	4	**Score**
Organization of presentation	Hard to follow; sequence of information jumpy	Most of information presented in sequence	Information presented in logical sequence; easy to follow	Information presented as interesting story in logical, easy to follow sequence	

Background content	Material not clearly related to topic **OR** background dominated seminar	Material sufficient for clear understanding **but** not clearly presented	Material sufficient for clear understanding **AND** effectively presented	Material sufficient for clear understanding **AND** exceptionally presented	
Methods	Methods too brief or insufficient for adequate understanding **OR** too detailed	Sufficient for understanding **but** not clearly presented	Sufficient for understanding **AND** effectively presented	Sufficient for understanding **AND** exceptionally presented	
Results (figures, graphs, tables, etc.)	Some figures hard to read	Majority of figures clear	Most figures clear	All figures clear	
	Some in inappropriate	Majority appropriately	Most appropriat	All appropriately formatted	
	Some explanation	Reasonably explained	Well explained	Exceptionally explained	
Contribution of work	Significance not mentioned or just hinted	Significance mentioned	Significance explained	Significance exceptionally well explained	
Knowledge of subject	Does not have grasp of information; answered only rudimentary questions	At ease with information; answered most questions	At ease; answered all questions **but** failed to elaborate	Demonstrated full knowledge; answered all questions with elaboration	
Presentation Skills					
	Inadequate	**Average**	**Admirable**	**Outstanding**	
	1	**2**	**3**	**4**	
Graphics (use of Powerpoint)	Uses graphics that rarely support text and presentation	Uses graphics that relate to text and presentation	Uses graphics thatexplain textand presentation	Uses graphics that explain and reinforce text and presentation	
Mechanics	Presentation has more than 10 misspellings and/or grammatical errors	Presentation has no more than 5 misspellings and/or grammatical errors	Presentation has no more than 2 misspellings and/or grammatical errors	Presentation has nomisspellings or grammatical errors	
Eye Contact	Reads most slides; no or just occasional eye contact	Refers to slides to make points; occasional eye contact	Refers to slides to make points; eye contact majority of time	Refers to slides to make points; engaged with points; audience	

Elocution -not ability to speak English language	Mumbles and/or Incorrectly pronounces some terms Voice is low; difficult to hear	Incorrectly pronounces some terms Incorrectly pronounces some terms low to clear;	Incorrectly pronounces few terms, Voice is clear with few fluctuations; audience can hear well most	Correct, precise pronunciation of all terms Voice is clear and steady; audience can hear well at all times	
Total Score					