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1. INTRODUCTION

1.1 Outcome Based Education (OBE) is an educational model that forms the base of a quality education system. There is no single specified style of teaching or assessment in OBE. All educational activities carried out in OBE should help the students to achieve the set goals. The faculty may adapt the role of instructor, trainer, facilitator, and/or mentor, based on the outcomes targeted.

OBE enhances the traditional methods and focuses on what the Institute provides to students. It shows the success by making or demonstrating outcomes using statements "able to do" in favor of students. OBE provides clear standards for observable and measurable outcomes.

WHY OBE?

- International recognition and global employment opportunities.
- More employable and innovative graduates with professional and soft skills, social responsibility and ethics.
- Better visibility and reputation of the technical institution among stakeholders.
- Improving the commitment and involvement of all the stakeholders.
- Enabling graduates to excel in their profession and accomplish greater heights in their careers.
- Preparing graduates for the leadership positions and challenging them and making them aware of the opportunities in the technology development.

BENEFITS OF OBE

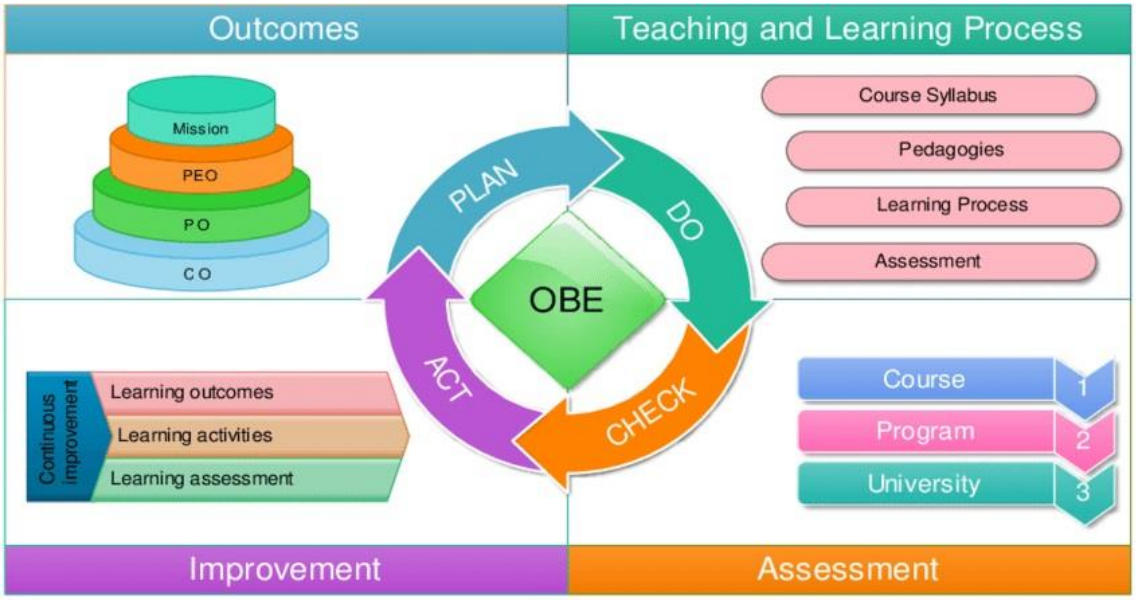
- **Clarity:** The focus on outcome creates · a clear expectation of what needs to be accomplished by the end of the course.
- **Flexibility:** With a clear sense of what needs to be accomplished, instructors will be able to structure their lessons around the students' needs.
- **Comparison:** OBE can be compared across the individual, class, batch, program and institute levels.
- **Involvement:** Students are expected to do their own learning. Increased student involvement allows them to feel responsible for their own learning, and they should learn more through this individual learning.

FEATURES OF OBE

OBE is an educational process that focuses on what students can do or the qualities they should develop after they are taught.

OBE involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of higher order learning and mastery rather than accumulation of course credits.

- Both structures and curricula are designed to achieve those capabilities or qualities.
- Discourages traditional education approaches based on direct instruction of facts and standard methods.
- It requires that the students demonstrate that they have learnt the required skills and content.



EXPECTATIONS OF STUDENTS UNDER OBE – THE OUTCOME

- Students are expected to be able to do more challenging tasks other than memorize and reproduce what was taught.
- Students should be able to: write project proposals, complete projects, analyze case studies, give case presentations, show their abilities to think, question, research, and make decisions based on the findings.
- Be more creative, able to analyze and synthesize information.
- Able to plan and organize tasks, able to work in a team as a community or in entrepreneurial service teams to propose solutions to problems and market their solutions.
- Students should be enriched on three dimensional scales of knowledge, skill and attitude throughout the course or programme

1.2. Terminology/Definitions as per ABET (Accreditation Board for Engineering and Technology)

Programme Educational Objectives:

Programme Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that the program is preparing, graduates to achieve.

Programme Outcomes:

Programme Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge and behaviors that students acquire in their matriculation through the programme.

Course Objectives:

Course Objectives are broad set of statements of teacher's intention, generally covering the syllabus content i.e., indicating what the teacher intends to teach. Course Objectives are written from the teacher's point of view.

Course Outcomes:

Course Outcomes (COs) are comprehensive set of statements of exactly what the students will be able to do/achieve after the successful learning of course. Outcomes are usually expressed as knowledge, skills or attitudes.

NOTE: *Course Objectives and Course Outcomes are to be framed by each teacher, at the beginning of the course.*

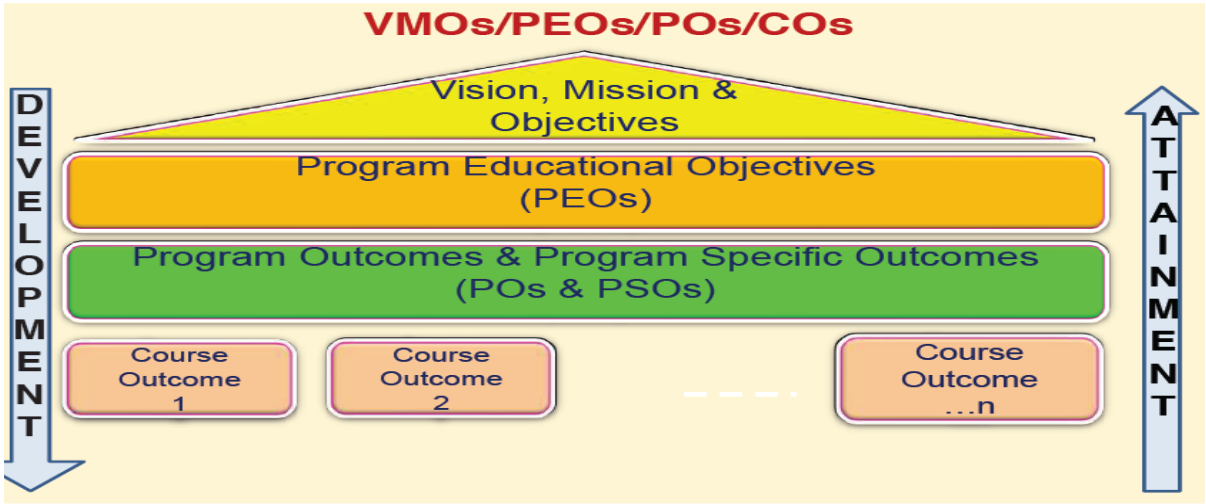
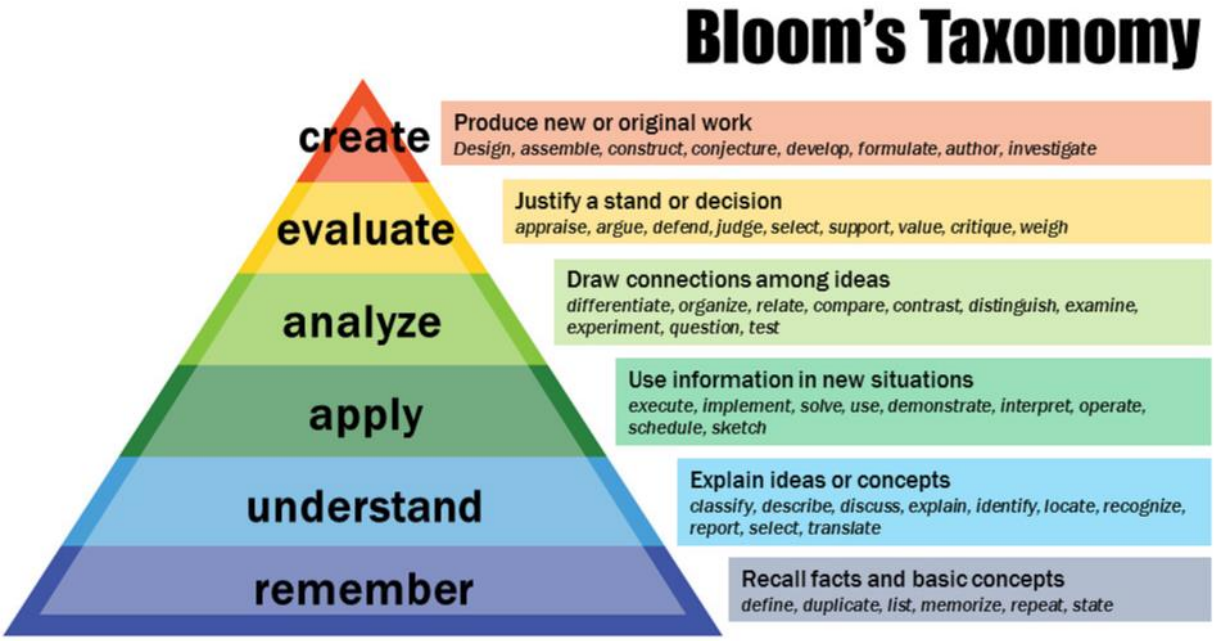


Fig. Development & Attainment of V / M / PEOs / POs / PSOs / COs

1.3. Bloom Taxonomy

Bloom Taxonomy is used for writing the Learning/Course Outcomes. Bloom proposed that teachers should design lessons, tasks, modules, courses and programmes to help students to achieve the stated Course Outcomes. Bloom's cognitive domain is composed of 6 successive levels arranged in a hierarchy:



Since learning outcomes are concerned with what the students can do at the end of the learning activity, use 'active' verbs along with the domain learning, for writing the 'Outcomes'. Active verbs and their usage in course outcomes are listed in the table below.

Level – 1	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.
Level - 2	Demonstrate Understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.
Level - 3	Solve Problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.
Level – 4	Examine And break information into parts by identifying motives or causes. Make Inferences and find evidence to support generalizations.
Level – 5	Present And defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.
Level – 6	Compile Information together in a different way by combining elements in a new pattern or proposing alternative solutions.

REVISED Bloom's Taxonomy Action Verbs

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

2. VISION, MISSION, PEOs, POs AND PSOs

2.1. Institute Vision & Mission

OUR VISION

To be a premier institution in education and research, producing global leaders in Engineering, Technology and management.

OUR MISSION

IM1: Emparting quality and outcome based education towards academic excellence.

IM2: Inculcate team spirit and professional ethics among stake holders.

IM3: Strengthen links with industry through internships and collaborative development works.

2.2. Department Vision, Mission

Vision of EEE department

To become a center of excellence in electrical and electronics engineering education, research and technology development to handle challenges of the nation, with innovation and critical thinking.

Mission of EEE department

DM1: Empower stakeholders with state of the art knowledge and technological skills

DM2: Promote industry institute interaction through practical problem solving.

DM3: To impart trainings for overall development.

DM4: To develop the ability to function in multi-disciplinary teams with emphasis on creativity and passion for the betterment of mankind.

2.3 Program Educational Objectives (PEOs):

PEO1: Graduates will be able to define, analyze and solve Electrical & Electronics engineering problems and employ necessary tools, techniques, hardware for modern Engineering applications.

PEO2: Graduates will be able to pursue successful career in MNCs, private and government organizations.

PEO3: Graduates will pursue higher studies to enhance their professional and inter-personal skills.

PEO4.Graduates will be able to contribute to the development of the chosen field with continuous learning.

2.4 Program Outcomes (POs)

Engineering Graduates will be able to:

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

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

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

PO4 CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 MODERN TOOL USAGE: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6 THE ENGINEER AND SOCIETY: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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

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

PO9 INDIVIDUAL AND TEAMWORK: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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

PO11 PROJECT MANAGEMENT AND FINANCE: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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

2.3 Program Specific Objectives (PSOs):

PSO1: Sustainable energy solutions: Design cutting edge technologies and provide solutions to overcome the Global Energy crisis.

PSO2: MATLAB, IOT Usage: Application of IOT, MATLAB in solving complex electrical engineering problems.

3. COURSE OUTCOMES

3.1. Introduction:

Course Outcomes are statements that describe significant and essential learning that learners have achieved and can reliably demonstrate at the end of a course. In other words, Course outcomes identify what the student will know and be able to do by the end of a course.

A Course outcome makes clear the intended result of the learning rather than what form the instruction will take. A good course outcome states what a student will know or be able to do at the end of instruction. It focuses on student performance. Other synonyms are Learning outcome or Course learning outcome.

The advantages of learning outcomes:

Benefits for the course and module designer

In terms of course and module design, the use of explicit course outcome statements can help ensure consistency of delivery across modules or programmes. They can aid curriculum design by clarifying areas of overlap between existing modules, programme and qualifications.

Benefits for quality assurance and standards

Quality assurance benefits from the adoption of learning outcomes via the resulting increase in transparency and better comparability of standards between and within qualifications.

Benefits for learners and employers

Learners benefit from a comprehensive set of statements of exactly what they will be able to achieve after successful study. Learning outcomes provide learners with clear information that can help them with their choice of module/unit/programme/qualification to study and can lead to more effective learning.

Benefits for national and international educational transparency

Internationally, learning outcomes contribute to the mobility of students by facilitating the recognition of their qualifications and improving the transparency of qualifications and thus simplifying credit transfer.

3.2. Guidelines for writing course outcomes:

When writing course outcomes it may be helpful to keep the following guidelines in mind:

- Write in the future tense – preceded with "On successful completion of this module, students will be able to:"

- Write in short clear sentences.
- Course outcomes should be as many outcomes as needed to clearly reflect what students will be able to doat the course end. Typically, an undergraduate course may have 4-6 overarching, student-centered learning outcomes.
- Use language to be understood by students, faculty and external examiners – therefore avoid jargon and abbreviations and free of ambiguous words or phrases.
- Use Bloom Taxonomy to write good course outcomes (level of student learning)
- COs should be SMART-Specific, Measurable, Attainable, Reliable, Time bound. This is made easier if COs were written with the students ability to demonstrate upon completion of the module and the assessment criteria in mind.
- Identify the most important learning requirements — each module should contain between 4 to 6 learning outcomes, and don't' try to put too much into a single learning outcome.
- Don't try to be either too broad or specific in the learning outcomes — divide your module into topics or themes you would like the students to demonstrate and write your learning outcomes around those.
- Ensure that the course outcomes written for a course should cover entire University Syllabus at minimum.

3.3 Identifying of levels of learning:

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts (rote learning).

Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order, which is classified as evaluation. A description of the six levels as well as verb examples that represent intellectual activity are listed here.

Bloom's Level	Related Action Verbs
Remember: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Choose, Define, Find, How, Label, List, Match, Name, Omit, Recall, Relate, Select, Show, Spell, Tell, What, When, Where, Which, Who, Why

Understand: Demonstrate Understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Classify, Compare, Contrast, Demonstrate, Explain, Extend, Illustrate, Infer, Interpret, Outline, Relate, Rephrase, Show, Summarize, Translate
Apply: Solve Problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Apply, Build, Choose Construct, Develop, Experiment with, Identify, Interview, Make Use of, Model, Organize, Plan, Select, Solve, Utilize
Analyse: Examine And break information into parts by identifying motives or causes. Make Inferences and find evidence to support generalizations.	Analyze, Assume, Categorize, Classify, Compare, Conclusion, Contrast, Discover, Dissect, Distinguish, Divide, Examine, Function, Inference, Inspect, List, Motive, Relationships, Simplify, Survey, Take Part in, Test For, Theme
Evaluate: Present And defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Agree, Appraise, Assess, Award, Choose, Compare, Conclude, Criteria, Criticize, Decide, Deduct, Defend Determine, Disprove, Estimate, Evaluate, Explain, Importance, Influence, Interpret, Judge, Justify, Mark, Measure, Opinion, Perceive, Prioritize, Prove, Rate, Recommend, Rule On, Select, Support, Value
Create: Compile Information together in a different way by combining elements in a new pattern or proposing alternative solutions.	Adapt, Build, Change, Choose, Combine, Compile, Compose, Construct, Create, Delete, Design, Develop, Discuss, Elaborate, Estimate, Formulate, Happen, Imagine, Improve, Invent, Make Up, Maximize, Minimize, Modify, Original, Originate, Plan, Predict, Propose, Solution, Solve, Suppose, Test, Theory

3.4. Course Outcome Statements:

Sl. No.	Regulation	Year / Semester	Course Code	Course Name
1	R16	I / I	C111	English - I
2			C112	Mathematics-I
3			C113	Applied Chemistry
4			C114	Engineering Mechanics
5			C115	Computer Programming
6			C116	Environmental Studies

COURSE NAME: ENGLISH-I (C111)

Faculty Name: K. DURGA RAO

CO CODE	COURSE OUTCOME	BLOOMS TAXONOMY LEVEL
C111.1	Classify and compare different resources to serve the needs of the society in different ways.	Applying
C111.2	apply road safety measures in day to day life in different modes of transport and write paragraphs effectively.	Analyzing
C111.3	apply science and technology in inventing latest engineering tools to discern their advantages and disadvantages.	Creating
C111.4	choose viable and alternative sources of energy to tide over the crisis of depleting sources.	Evaluating
C111.5	explain the importance of bio-diversity and ecological balance like preservation of Flora and Fauna and develop writing skills.	Understanding
C111.6	discover various safety measures against hazards at home, labs, industry and work places as well and familiarize themselves with office etiquette & ethics.	Analyzing

COURSE NAME: Mathematics – I (C112)

Faculty Name: P N V Ganesh

C112.1	Solve the first order differential equations and able to apply physical problems.	Applying
C112.2	Solve higher order linear differential equations with constant coefficients.	Applying

C112.3	Find the Laplace transform of functions and evaluation of integrals and inverse Laplace transform of different functions and solve the differential equations using Laplace transform.	Applying
C112.4	Find the partial derivative of different orders, finding maxima and minima of function of two variable, three variables and functional dependence.	Applying
C112.5	Find the partial derivative by elimination of arbitrary function and arbitrary constant. Solve the linear and non-linear PDE's	Applying
C112.6	Solve the partial differential equations using homogenous and non-homogenous.	Applying

COURSE NAME: Applied Chemistry (C113)		
Faculty Name: T S L Kaveri		
C113.1	Analyze the concept of improvement of impact strength of plastic materials.	Analyzing
C113.2	Make use of electrochemical series while preparing different cells.	Applying
C113.3	Analyze and interprets the formation of different nano materials.	Analyzing
C113.4	Explain different forms of energy in atoms and molecules change upon interacting with electromagnetic radiation.	Applying
C113.5	Utilizes the non- conventional energy resources purposefully.	Understanding
C113.6	obtain the knowledge of computational chemistry and molecular machines.	
COURSE NAME: Engineering Mechanics (C114)		
Faculty Name: C H. Naresh		
C114.1	Explain the force concepts, Resultant of Force Systems and Friction.	Understanding
C114.2	Develop FBD's, explain spatial system of forces and Define various laws and Theorems.	Applying
C114.3	Demonstrate concepts of centroid and center of gravity.	Analyzing

C114.4	Illustrate Area, Polar and Mass moment of Inertia and their applications.	Creating
C114.5	Explain motion in straight line and in curvilinear paths and plane motion.	Creating
C114.6	Explain Work-Energy and applications, fixed axis rotation, Impulse momentum method.	Creating
COURSE NAME: Computer programming(C115)		
Faculty Name: P T S N Murthy		
C115.1	Demonstrate the basic components and software's used in computer programming language.	Creating
C115.2	Develop and compile and debug programs in C language and Demonstrate syntaxes, predefine functions & operators in computer programming language.	Analyzing
C115.3	Build the c programs involving decision making statements, looping statements and understand the control flow of the program.	Analyzing
C115.4	Choose Functions and Recursion concepts to solve the complex c programs.	Analyzing
C115.5	Discuss arrays, strings and develop c programs using string manipulation functions.	Creating
C115.6	Analyze different file handling functions and dynamic memory management functions.	Analyzing
COURSE NAME: Environmental Studies (C116)		
Faculty Name: G Ashok		
C116.1	explain the eco system and its function in the environment.	Understanding
C116.2	aware the importance of natural resources and it's conversation.	Understanding
C116.3	analyze the diversity of life on earth and its importance.	Analyzing
C116.4	Execute different programmes in eco-friendly way.	Applying
C116.5	Describe the different laws to protect our environment.	Analyzing
C116.6	conduct Research in safe and Responsible manners communicating the environmental subject more effectively.	Applying

Sl. No.	Regulation	Year / Semester	Course Code	Course Name
1	R16	I / II	C121	English-II
2			C122	Mathematics II
3			C123	Mathematics III
4			C124	Applied Physics
5			C125	Electrical Circuit Analysis-1
6			C126	Engineering Drawing

COURSE NAME: English-II(C121)		
Faculty Name: K Durga Rao		
C121.1	Relate the very purpose of education is to enhance knowledge and wisdom.	Applying
C121.2	Develop global harmony and peaceful co-existence among people and society.	Applying
C121.3	Discover different cultures due to globalization and manage different cultural shocks.	Applying
C121.4	Examine outdated traditions in society with the application of wisdom.	Applying
C121.5	Compare and contrast various protective measures of environment for peaceful existence of future generations and learn report writing for media.	Applying
C121.6	Select the eminent personalities and build luminous future successfully with their inherent passion, interest and burning desire in their areas of interests.	Application
COURSE NAME: MATHEMATICS – II (C122)		
Faculty Name: N V R S C Murthy		
C122.1	Solve the algebraic and transcendental equations by different methods.	Evaluating
C122.2	Solve the different interpolation formulae to find a polynomial or the value of the polynomial at a given point.	Evaluating
C122.3	Find the Quadrature, the solutions of ordinary differential equations by different formulae.	Applying
C122.4	Interpret a function as a Fourier series Dirichlet's conditions.	Applying

C122.5	Solve the problems on Fourier transforms using real and complex functions.	Applying
C122.6	Demonstrate capacity to mode physical phenomena using PDE's and to apply problem solving using concepts and techniques from PDE and Fourier analysis applied to diverse situation in physics, engineering mathematics.	Applying
COURSE NAME: Mathematics-III (C123)		
Faculty Name: P N V Ganesh		
C123.1	Find Rank and Solve the linear system of equations by using different methods.	Understanding
C123.2	Find the eigen values and eigen vectors and also finding inverse and power of a matrix by using Cayley Hamilton theorem. And also diagonalize the matrix by using various methods. Finding Rank, Index, Signature and Nature of a Quadratic form	Applying
C123.3	Tracing the curve for the given equation, evaluate the double and triple integrals by direct methods, change of order of integration and change of variables.	Analyzing
C123.4	Evaluate the given integrals by using Beta and Gamma functions.	Evaluating
C123.5	Find the gradient of a scalar field, divergence and curl of vector field and vector identities.	Understand
C123.6	Evaluate the line, surface and volume integrals. Solve the problems using Vector integral theorems.	Analyzing
COURSE NAME: Applied Physics(C124)		
Faculty Name: P Srikanth		
C124.1	Explain the physical significance of optics and hence estimate the speed of light, wavelength, refractive index by using interference.	Understanding
C124.2	Explain the resolving power of various optical instruments like grating, telescope and microscope.	Applying
C124.3	Explain about polarized light and optical activity using polarization and describe the construction and working of various lasers.	Understanding

C124.4	Develop various engineering applications involving electromagnetic fields.	Analyzing
C124.5	Apply the knowledge of basic quantum mechanics and summarize the importance of free electrons in determining the properties of metals.	Applying
C124.6	Classify materials as metals, insulators, semiconductors and explain the properties of semiconductors with application to the hall effect.	Analyzing

COURSE NAME: Electrical Circuit Analysis-1 (C125)		
Faculty Name: Siva Prasad Ponnaganti		
C125.1	Apply the solution methods such as nodal analysis and mesh analysis	Applying
C125.2	Solve circuits using tree, node, branch, cut set, tie set methods.	Applying
C125.3	Discuss magnetic circuits concepts.	Remembering
C125.4	Apply AC circuits concepts to find various performance parameters of electrical network.	Analyzing
C125.5	Explain single phase circuit concepts to obtain locus diagrams and resonance.	Applying
C125.6	Evaluate various networks by using principles of network theorems.	Analysis

COURSE NAME: Engineering Drawing (C126)		
C126.1	Classify the basic concepts, methodologies of engineering drawing, visualize and construct curved profiles in developing new products like gears and other engineering applications.	Understanding
C126.2	Construct various types of scales for engineering application like maps, buildings, bridges.	Applying
C126.3	Analyze the concept of projections involving points and lines.	Analyzing
C126.4	Analyze the theory of projection in planes and apply in manufacturing processes.	Analyzing
C126.5	Analyse the concept of projection of solids inclined to both the planes.	Analyzing

C126.6	Develop the orthographic projections and imagine the components by isometric projection by representing three dimensional objects in 2D in technical and engineering drawings.	Applying

Sl. No.	Regulation	Year / Semester	Course Code	Course Name
1	**R16**	**II / I**	**C211**	Electrical Circuit Analysis-II
2			**C212**	Electrical Machines-1
3			**C213**	Basic Electronics & Devices
4			**C214**	Electro Magnetic Fields
5			**C215**	Thermal & Hydro prime movers
6			**C216**	Managerial Economics and Financial Analysis

COURSE NAME: Electrical Circuit Analysis-II (C211)		
Faculty Name: A N V J Raja Gopal		
C211.1	Solve the three-phase circuits under balanced load condition	Evaluating
C211.2	Solve the three-phase circuits under unbalanced load condition.	Understanding
C211.3	Analyze the transient behavior of electrical networks with DC, Pulse and AC excitations.	Analyzing
C211.4	Calculate the parameters of a network based on input and Output excitation/response.	Evaluate
C211.5	Calculate the parameters of a network based on input and Output excitation/response.	Creating
C211.6	Analyze the electrical circuits by applying Fourier series and Fourier Transform.	Analyzing
COURSE NAME: Electrical Machines-1(C212)		
Faculty Name: V Venkatesh		
C212.1	Able to assimilate the concepts of electromechanical energy conversion.	Understanding

C212.2	Able to mitigate the ill-effects of armature reaction and improve commutation in dc machines.	Understanding
C212.3	Able to understand the torque production mechanism and control the speed of dc motors	Evaluating
C212.4	Able to analyze the performance of single-phase transformers	Understanding
C212.5	Able to predetermine regulation, losses and efficiency of single-phase transformers.	Understanding
C212.6	Able to parallel transformers, control voltages with tap changing methods and achieve three-phase to two-phase transformation	Evaluating

COURSE NAME: Basic Electronics & Devices (C213) **Faculty Name: M. Adi Lakshmi Devi**		
C213.1	Students can able to learn the basics of semiconductor physics.	Remembering
C213.2	Students can able to study the construction details, operation and characteristics of various semiconductor diodes.	Understanding
C213.3	Students can able to understand the operation and analysis of rectifiers with and without filters. Further study the operation of series and shunt regulators using Zener diodes.	Creating
C213.4	Students can be able to study the characteristics of different bipolar junction transistors and their biasing stabilization and compensation techniques and analyze transistor amplifiers using h- parameters.	Analyzing
C213.5	Students can be able to understand the basics of FET Thyristors, Power IGBTs and Power MOSFETs.	Evaluating
C213.6	Students can able to understand the concepts of positive and negative feedbacks and their role in amplifiers and oscillators.	
COURSE NAME: Electro Magnetic Fields(C214) **Faculty Name: A. Sita Ram**		
C214.1	Apply vector calculus to static electric - magnetic fields in different engineering situations.	Applying
C214.2	Design and calculate the capacitance values and energy stored in dielectrics.	Creating

C214.3	Evaluate the magnetic field intensity due to current and the application of ampere's law and to analyze maxwell's equation in different form.	Evaluating
C214.4	Assess the magnetic forces and torque produced by current in magnetic field.	Applying
C214.5	Solve problems involving self and mutual inductances and energy stored in magnetic fields.	Creating
C214.6	Examine Maxwell's equations in time varying Electromagnetic fields.	Analyzing
COURSE NAME: Thermal & Hydro Prime movers (C215)		
C215.1	Apply the Otto, diesel cycles for finding the performance of S. I and C.I engine.	Applying
C215.2	Illustrate the steam formation and its utilities through the standard steam data tables.	Understanding
C215.3	Examine the simple gas turbine fundamentals and methods to improve the efficiency of gas turbines.	Analyzing
C215.4	Evaluate the performance characteristics of centrifugal and reciprocating pumps.	Creating
C215.5	compare the constructional features, operational details of various types of hydraulic turbines	Analyzing
C215.6	Identify the main components of hydroelectric power plants.	Applying
COURSE NAME: Managerial Economics and Financial Analysis(C216) **Faculty Name: Pamarthi K.Chaitanya**		
C216.1	Interpret the fundamental concepts of managerial economics.	Understanding
C216.2	Classify and compare various costs in managerial decision-making process.	Analyzing
C216.3	Analyze different kinds of markets and various pricing strategies	Analyzing
C216.4	Identify various forms of business optimization and their procedure.	Applying
C216.5	Identity fundamental concepts of accounting and analyze financial statements.	Analyzing
C216.6	Identity fundamental concepts of accounting and analyze financial statements.	Evaluating

Sl. No.	Regulatio	Year / Semester	Course	Course Name
1	R16	II / II	C221	Electrical Measurements
2			C222	Electrical Machines-II
3			C223	Switching Theory & Logic Design
4			C224	Control Systems
5			C225	Power System-1
6			C226	Management Science

COURSE NAME: Electrical Measurements (C221) **Faculty Name: Ponnaganti Siva Prasad**		
C221.1	Are you able to measure voltage and current by using different types of instruments?	Understanding
C221.2	Did you able to understand working principles of different types of measuring instruments to measure power and energy?	Understanding
C221.3	Are you able to understand working principles of DC and AC potentio meters?	Evaluating
C221.4	Are you able to understand working principles of various bridges to measure inductance resistance and capacitance?	Applying
C221.5	Are you able to understand working principles of various magnetic measuring instruments?	Analyzing
C221.6	Did you able to apply CRO for find out unknown frequency and phase difference?	Applying
COURSE NAME: Electrical Machines-II (C222) **Faculty Name: Mutyala Adi Lakshmi devi**		
C222.1	Understand the principle of operation and performance of 3-phase induction motor.	Understanding
C222.2	Quantify the performance of induction motor and induction generator in terms of torque and slip.	Analyzing
C222.3	understand the torque producing mechanism of a single-phase induction motor.	Applying
C222.4	understand the principle of emf generation, the effect of armature reaction and predetermination of voltage regulation in synchronous generators.	Creating
C222.5	study parallel operation and control of real and reactive powers for synchronous generators.	Creating

C222.6	understand the operation, performance and starting methods of synchronous motors.	Understanding
COURSE NAME: Switching Theory & Logic Design (C223) **Faculty Name: Ande N V J Raja Gopal**		
C223.1	Recall the number systems and basic logic operations	Remembering
C223.2	Demonstrate Boolean theorems minimization of functions using K-map and Tabulation Method	Understanding
C223.3	Analyze various combinational circuits by applying the acquired knowledge in K-maps and logic gates.	Applying
C223.4	Classify PROM, PAL, PLA and compare their Merits and Demerits	Understanding
C223.5	Analyze various Synchronous, Asynchronous Counters and Registers	Creating
C223.6	Analyze Clocked sequential circuits state diagrams and state tables.	Analyzing
COURSE NAME: Control Systems (C224) **Faculty Name: K. Durga Devi**		
C224.1	Model the transfer function of physical systems, determination of overall transfer function using block diagram algebra and signal flow graphs Model the transfer function of physical systems, determination of overall transfer function using block diagram algebra and signal flow graphs.	Applying
C224.2	Determine the time response specifications of second order systems and to estimate the error constants.	Evaluating
C224.3	Analyze absolute stability and relative stability of LTI systems using Rout's stability criterion and root locus method.	Analyzing
C224.4	Analyze stability of LTI systems using frequency response methods.	Analyzing
C224.5	Able to design Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram.	Creating
C224.6	To model the physical systems as state models and to determine their system response to judge systems controllability and observability.	Applying

COURSE NAME: Power Systems-1 (C225) **Faculty Name: A. Shanti Priya**		
C225.1	Demonstrate the general layout, major equipment's and auxiliaries in thermal power station.	Understanding
C225.2	Explain the general layout, major equipment and different types of reactors in nuclear power station.	Understanding
C225.3	Solve the different types of distribution systems	Analyzing
C225.4	Compare the air and gas insulated substations	Creating
C225.5	Identify the single, multi core cables with different insulating materials.	Understanding
C225.6	Analyze the different economic factors of power generation and Calculation of tariff for different customers.	Analyzing
COURSE NAME: Management Science (C226) **Faculty Name: P.Krishna chaitanya**		
C226.1	Explain the management functions and decision-making process.	Understanding
C226.2	Analyze the materials management and inventory management techniques.	Analyzing
C226.3	Explain the concepts of functional management and marketing management.	Understanding
C226.4	Solve the concepts of project management problems.	Applying
C226.5	Interpret the concepts of strategic management	Understanding
C226.6	Evaluate energy consumption levels at various modes of operation.	Creating

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	**R16**	**III / I**	**C311**	Power Systems-II
2			**C312**	Renewable Energy Sources
3			**C313**	Signals & Systems
4			**C314**	Pulse & Digital Circuits
5			**C315**	Power Electronics

COURSE NAME: Power Systems-II (C311)

Faculty Name: Vavilala Venkatesh		
C311.1	Analyze the parameters of various types of transmission lines during various conditions.	Analyzing
C311.2	Understand the performance of short and medium transmission lines in power systems	Understanding
C311.3	Understand the performance of long transmission lines in power systems	Evaluating
C311.4	Understand travelling waves on transmission line	Analyzing
C311.5	Understand the various factors related to charge on transmission lines	Remembering
C311.6	understand sag/tension of transmission lines and performance of insulators.	Creating
COURSE NAME: Renewable Energy Sources (C312)		
Faculty Name: P Siva Prasad		
C312.1	selecting a suitable motor for electric drives with respect to loading conditions	Analyzing
C312.2	Employ the most appropriate heating and welding techniques for industrial applications.	Creating
C312.3	Distinguish the entities in the illumination systems and their units and measurement of illumination	Creating
C312.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Understanding
C312.5	Distinguish the different schemes of traction and its main components.	Evaluating
C312.6	Evaluate energy consumption levels at various modes of operation.	Understanding
COURSE NAME: Signals & Systems (C313)		
Faculty Name: G Madhu Ganesh		
C313.1	selecting a suitable motor for electric drives with respect to loading conditions	Understanding
C313.2	Employ the most appropriate heating and welding techniques for industrial applications.	Analyzing
C313.3	Distinguish the entities in the illumination systems and their units and measurement of illumination.	Understanding

C313.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Creating
C313.5	Distinguish the different schemes of traction and its main components.	Analyzing
C313.6	Evaluate energy consumption levels at various modes of operation.	Analyzing
COURSE NAME: Pulse & Digital Circuits (C314) **Faculty Name: Dr B Muthvel**		
C314.1	Analyze and design linear wave shaping circuits.	Analyzing
C314.2	Analyze and design Non-linear wave shaping circuits.	Analyzing
C314.3	Recall the characteristics of various switching devices such as diode and transistor.	Remembering
C314.4	Design Multivibrators for various applications.	Creating
C314.5	Design Time base generators for various applications and to show synchronization techniques and explains the sweep circuits.	Creating
C314.6	Build the basic sampling gates and their types and their applications and to realize different logic gates and analyzing the outputs.	Applying
COURSE NAME: Power Electronics (C315) **Faculty Name: M Phani**		
C315.1	Analyze the characteristics of various power semiconductor devices and to model the firing and protecting circuits for power semiconductor devices	Creating
C315.2	Develop the single-phase converters for different loads and to evaluate the converters performance by analyzing different electrical parameters	Analyzing
C315.3	Justify the three phase full converters for different loads and to distinguish between single phase and three phase converters.	Analyzing
C315.4	Develop and study the performance characteristics of various DC to DC Converters and to derive the suitable formulae for mathematical approximation	Creating
C315.5	Assess the working of various inverters and evaluate the PWM techniques for voltage control and harmonic mitigation	Evaluating

C315.6	Design a suitable AC to AC regulator for variable AC supply requirements for different applications	Creating

Sl. No.	Regulatio	Year / Semester	Course	Course Name
1	**R16**	**III / II**	**C321**	Power Electronic Controllers &
2			**C322**	Power System Analysis
3			**C323**	Micro Processors & Micro
4			**C324**	Data Structures
5			**C325**	OOPS through Java

COURSE NAME: Power Electronic Controllers & Drives (C321)		
Faculty Name: V Venkatesh		
C321.1	Summarize the concepts of conventional DC drive	Understanding
C321.2	Analyze the performance of various semi-conductor controlled DC drives	Analyzing
C321.3	Identify and enhance uses of dc drive in modern applications	Applying
C321.4	Analyze the performance of AC motors with various control strategies	Analyzing
C321.5	Interpretation of AC drive systems	Evaluating
C321.6	Identify the suitability of control methods of AC Drives for industrial applications	Applying
COURSE NAME: Power System Analysis (C322)		
Faculty Name: SHANMUKHA SRIRAM SALADI		
C322.1	Able to understand the per unit system and draw impedance diagram for a power system network.	Creating
C322.2	Analyze load flow computations and load flow results using different methods.	Evaluating
C322.3	Formulate Y-bus and Z-bus for power system network.	Creating
C322.4	Interpret a network under both balanced and unbalanced fault condition and interpret result to provide the data for design of protecting devices	Understanding
C322.5	Examine positive sequence, negative sequence and zero sequence system and fault analysis	Analyzing

C322.6	Examine positive sequence, negative sequence and zero sequence system	Analyzing
COURSE NAME: Micro Processor & Micro Controllers (C323) **Faculty Name: V V S N Murthy**		
C323.1	Illustrate the 8086 Architecture and Register organization, Pin diagram and general bus operations, compare 8086 with xxx86	Understanding
C323.2	Classify The Addressing modes and Instruction set, Minimum mode and maximum mode of 8086	Understanding
C323.3	Apply Various interfacing modules like 8255, A to D converters, Interfacing 8257, IO devices and Key board interface with 8086	Applying
C323.4	Summarize The 8051 Micro Controller Architecture, timers, types of instructions and various modules.	Understanding
C323.5	Illustrate The PIC registers, serial IOs, architecture.	Understanding
C323.6	Develop different types of logical operations and data conversions with the help of I/O programming.	Creating
COURSE NAME: Data Structures (C324) **Faculty Name: M L Rekha**		
C324.1	Describe the basic concepts of data structures and algorithms.	Remembering
C324.2	Interpret arrays, stack, queue operations and applications.	Understanding
C324.3	Select the appropriate data structure choosing given problem	Evaluating
C324.4	Solve problem involving trees	Creating
C324.5	Analyze different paths algorithms related graphs. (Analyzing)	Analyzing
C324.6	Apply Algorithm for solving problems like sorting, searching.	Creating
COURSE NAME: OOPS through Java(C325) **Faculty Name: Billa Divya Prakash**		
C325.1	Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.	Understanding
C325.2	Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem	Applying
C325.3	Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.	Understanding

C325.4	Make use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.	Applying
C325.5	Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events	Creating
C325.6	Identify, Design & develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture	Applying

Sl. No.	Regulatio	Year / Semester	Course	Course Name
1	**R16**	**IV / I**	**C411**	Utilization of Electrical Energy
2			**C412**	Linear IC Applications
3			**C413**	Power System Operation & Control
4			**C414**	Switch Gear & Protection
5			**C415**	Instrumentation (Elective I)
6			**C416**	Electric Power Quality (Elective II)

COURSE NAME: Utilization of Electrical Energy (C411)

Faculty Name: CHALADI S GANGA BHAVANI

C411.1	selecting a suitable motor for electric drives with respect to loading conditions	Remembering
C411.2	Employ the most appropriate heating and welding techniques for industrial applications.	Remembering
C411.3	Distinguish the entities in the illumination systems and their units and measurement of illumination	Analyzing
C411.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Creating
C411.5	Distinguish the different schemes of traction and its main components.	Analyzing
C411.6	Evaluate energy consumption levels at various modes of operation.	Remembering

COURSE NAME: Linear IC Applications (C412) **Faculty Name: Dr B Muthuvel**		
C412.1	Understand the basic operation &performance parameters of differential amplifiers	Applying
C412.2	Design circuits using operational amplifiers for various applications.	Understanding
C412.3	Design and diagnose and trouble-shoot linear electronic circuits.	Applying
C412.4	Analyze and design amplifiers and active filters using Op-amp.	Analyzing
C412.5	Design circuits using 555 Timer IC & Analog Multiplier IC for various applications	Understanding
C412.6	Analyze and design Analog to Digital IC and Digital to Analog ICs for various applications	Analyzing
COURSE NAME: Power system Operation & Control (C413) **Faculty Name: Chaladi S Ganga Bhavani**		
C413.1	Compute optimal scheduling of Generators.	Understanding
C413.2	Elaborate hydrothermal scheduling	Creating
C413.3	Discuss the unit commitment Problem	Remembering
C413.4	Distinguish the load frequency control for single area system with and without controllers	Applying
C413.5	Contrast the load frequency control for two area system with and without controllers	Evaluating
C413.6	Explore reactive power control in power systems and compensation of transmission lines	Creating
COURSE NAME: Switch Gear & Protection (C414) **Faculty Name: SURYA CHANDRA PRAKASH RAO SANABOINA**		
C414.1	selecting a suitable motor for electric drives with respect to loading conditions	Understanding
C414.2	Employ the most appropriate heating and welding techniques for industrial applications.	Understanding

C414.3	Distinguish the entities in the illumination systems and their units and measurement of illumination.	Remembering
C414.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Understanding
C414.5	Distinguish the different schemes of traction and its main components.	Understanding
C414.6	Evaluate energy consumption levels at various modes of operation.	Understanding
COURSE NAME: Instrumentation (C415) **Faculty Name: P SIVA PRASAD**		
C415.1	Knowing about various types of signals and representing them	Understanding
C415.2	learn knowledge about various kinds of transducers like mechanical, electrical, electromechanical and optical transducers	Remembering
C415.3	measurement of non-electrical quantities	Applying
C415.4	knowing about various kinds of digital volt meters	Remembering
C415.5	details knowing about oscilloscope and its applications	Understanding
C415.6	study various types of signal analyzers	Understanding

COURSE NAME: Electric Power Quality (C416) **Faculty Name: K Durga Devi**		
C416.1	Explain different types of power quality phenomena.	Understanding
C416.2	Analyze the harmonic sources, passive filters, active filters and standards	Creating
C416.3	Explain the principle of voltage regulation and power factor improvement methods	Understanding
C416.4	Analyze the harmonic sources, passive filters, active filters and standards	Analyzing
C416.5	Explain about the relationship between distributed generation and power quality.	Understanding

C416.6	Explain about power quality monitoring method, equipment and analyze the measured data	Analyzing

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	**R16**	**IV/ II**	**C421**	Digital Control Systems
2			**C422**	HVDC Transmission
3			**C423**	Electrical Distribution Systems
4			**C424**	High Voltage Engineering (Elective-III)

COURSE NAME: Digital Control Systems (C421)

Faculty Name: K DURGA DEVI

C421.1	Explain digital control systems and their applications.	Understanding
C421.2	Analyze digital control systems in the z-domain and its properties.	Applying
C421.3	Explain the basic principles and modeling of digital control system in transfer function and state-space domain	Understanding
C421.4	Solve analysis techniques like Jury stability criteria and Routh stability criteria	Applying
C421.5	Explain the design procedure for controller for digital control system using root locus method, Bilinear transformation	Understanding
C421.6	Elaborate the fundamentals and design procedures of deadbeat controllers for dig control system	Creating

COURSE NAME: HVDC Transmission (C422)

Faculty Name: MUTHYALA ADILAKSHMI DEVI

C422.1	Understand the t of HVDC transmission systems.	Creating
C422.2	Analyze the HVDC Converters.	Understanding
C422.3	Understand the control of HVDC system and power control.	Understanding
C422.4	understand the Reactive Power control in HVDC.	Understanding
C422.5	Analyze the power flow in AC/DC systems.	Understanding
C422.6	Analyze the different faults and what type of protection is needed.	Understanding

COURSE NAME: Electrical Distribution Systems (C423) Faculty Name: SURYA CHANDRA PRAKASH RAO SANABOINA		
C423.1	Differentiate the types of loads and their characteristics.	Understanding
C423.2	Analyze radial and loop type distribution feeders.	Creating
C423.3	Determine the voltage drop and power loss in a distribution system.	Applying
C423.4	Develop protection system and its co-ordination in distribution system.	Creating
C423.5	Analyze the best methods for power factor improvement and voltage control.	Applying
C423.6	Understand the effect of capacitance in voltage control of distribution system.	Analyzing
COURSE NAME: High Voltage Engineering (C424) Faculty Name: CHALADI S GANGA BHAVANI		
C424.1	Understand the Performance of High Voltages with regard to different configuration of electrode systems	Understanding
C424.2	Illustrate the theory of breakdown and withstand phenomena of all types of dielectric materials.	Remembering
C424.3	Employ the techniques of generation of AC, DC and Impulse Voltages	Understanding
C424.4	Apply Knowledge for measurement of High Voltage and High Current AC, DC and impulse	Applying
C424.5	Measure dielectric property of material used for HV equipment	Evaluating
C424.6	Test various equipment used in HV engineering	Analyzing

Laboratory Course Outcomes:

The associated course outcomes are taken as governing course outcomes for the Laboratories. For example, Electrical Measurements lab – All COs of Electrical measurements theory course will be taken.

In case, of a particular lab is associated with more than one theory course, All the Course COs of the associated theory courses will be considered

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	**R16**	**I / I**	**C117**	**Applied / Engineering Chemistry laboratory**

2			**C118**	**English communication skills laboratory - I**
3			**C119**	**Computer Programming laboratory**

COURSE NAME: Applied/ Engineering Chemistry laboratory(C117) **Faculty Name: T S L KAVERI**		
C117.1	Determine Wavelength of a source and radius of curvature of convex lens	Understanding
C117.2	Determine rigidity modulus of a material	Analyzing
C117.3	Determine acceleration due to gravity	Applying
C117.4	verify laws of vibrations and melds law	Analyzing
C117.5	Study the characteristics of diode	Analyzing
C117.6	Characteristics of Semiconductor	Analyzing
COURSE NAME: English Communication Skills laboratory-I(C118) **Faculty Name: Mr. K DURGARAO**		
C118.1	Explain why study spoken English is important to become successful in the competitive world and situational dialogues.	Applying
C118.2	Construct appropriate sentences for requests, asking for and giving permissions, asking for and giving directions in live situations.	Understand
C118.3	Choose appropriate phrases for inviting, complaining, congratulating, apologizing, advising, suggesting, agreeing, and disagreeing and expressing sympathy.	Evaluating
C118.4	Demonstrate the basics of English phonetics and the lack of one-to-one correspondence between the alphabet and the sounds of English. (Understanding)	Applying
C118.5	Make use of International Phonetic Alphabet in order to improve pronunciation while Speaking and Listening. (Applying)	Analyzing
C118.6	Categorize the principles of silent letters and pronunciation of inflections, stress and intonation in English.	Understanding

COURSE NAME:Computer Programming Laboratory(C119)		
C119.1	Demonstrate the basic components and software used in computer programming language.	Applying
C119.2	Develop and compile and debug programs in c language and demonstrate syntaxes, predefined functions and operators in computer programming language.	Evaluating
C119.3	Build the c programs involving decision making statements, looping statement and understand the control flow of the program	Creating
C119.4	Students will able to choose functions and recursion concepts to solve the complex c programs.	Evaluating
C119.5	Discuss arrays, strings and develop c programs using string manipulation functions.	Creating
C119.6	Analyze different file handling functions and dynamic memory management functions.	Analyzing

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	**R16**	**I / II**	**C127**	**English communication skills laboratory-II**
2			**C128**	**Applied / Engineering Physics Laboratory**
3			**C129**	**Applied/Engineering Physics-virtual labs-Assignments**
3			**C1210**	**Eng Workshop & IT Workshop**

COURSE NAME: English Communication skills laboratory-II(C127) **Faculty Name: Mr. K DURGARAO**		
C127.1	Demonstrate how to speak politely and effectively with supporting facts/points against the speakers who are taking the opposing views.	Understanding
C127.2	Analyze the given topic, share the information and opinions and act efficiently as an individual and team member.	Analyzing
C127.3	Select a suitable presentation with proper presentational aids to present the information.	Applying

C127.4	Develop an idea about various kinds and stages of interviews to face interviews confidently.	Analyzing
C127.5	Apply techniques to write Curriculum Vitae and E-mails to suit different contexts.	Applying
C127.6	Make use of idiomatic expressions of English in Speech and Writing and minimize common errors in usage of English. (Applying)	Applying
COURSE NAME: Applied / Engineering Physics Laboratory(C128)		
Faculty Name: P SRIKANTH		
C128.1	Determine Wavelength of a source and radius of curvature of convex lens	Understanding
C128.2	Determine rigidity modulus of a material	Understanding
C128.3	Determine acceleration due to gravity	Analyzing
C128.4	Verify laws of vibrations and melds law	Analyzing
C128.5	Study the characteristics of diode	Analyzing
C128.6	Characteristics of Semiconductor	
COURSE NAME: Applied/Engineering Physics- Virtual Lab-Assignments(C129)		
Faculty Name: K Venkateswa Rao		
C129.1	Explain the slit width, wavelength using LASER	Understanding
C129.2	Explain the Numerical Aperture by using optical fiber.	Understanding
C129.3	Verify the photo electric effect.	Understanding
C129.4	Verify the laws of Damped oscillations and simple pendulum	Understanding
C129.5	Determining the value by using B-H curve and Hysteresis	Understanding
C129.6	Determining the value by using Hall effect.	Understanding
COURSE NAME: Eng Workshop & IT Workshop(C1210)		
Faculty Name:		
C1210.1	Prepare various joins with the available work materials.	Creating
C1210.2	Understand and connects different circuits in house wiring.	Understanding
C1210.3	Identify the peripherals of computer, installation and assembling, disassembling.	Analyzing

C1210.4	Identification & fix a problem and demonstrating importance of network	Applying
C1210.5	Demonstrate search engines & cyber hygiene.	Understanding
C1210.6	Creating a project with MS office.	creating

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	R16	II / I	C217	Thermal and Hydro Laboratory
2			C218	Electrical Circuits Laboratory

COURSE NAME: Thermal and Hydro Laboratory(C217)		
Faculty Name: M DURGA BHAVANI		
C217.1	Measure the impact of jet on different types of plates	Evaluating
C217.2	Determine the co-efficient of discharge of an Orifice meter & Venturi meter	Applying
C217.3	Conduct the performance test on a Single stage centrifugal pump & Reciprocating pump	Applying
C217.4	Conduct the performance test on a twin cylinder diesel engine & multi cylinder engine	Applying
C217.5	Conduct Heat balance test, Morse test & Retardation Test	Analyzing
C217.6	Determine the valve timing diagram of SI engine & CI engine	Evaluating
COURSE NAME: Electrical Circuits Laboratory (C218)		
Faculty Name: M ADILAKSHMI DEVI		
C218.1	verify and demonstrate various theorems.	Evaluating
C218.2	Determine self and mutual inductance of a magnetic circuit, parameters of a given coil and measurement of 3- phase power.	Remembering
C218.3	verify locus diagrams, resonance and two port networks.	Analyzing

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	R16	II / II	C227	Electrical Machines-1 Laboratory
2			C228	Electronic Devices & Circuits Laboratory

COURSE NAME: Electrical Machines-1 Laboratory(C227) **Faculty Name: S S C Prakash Rao**		
C227.1	Determine the magnetic characteristics of DC Shunt generator and understand the mechanism of self-excitation.	Applying
C227.2	Determine performance of DC machines and Transformers	Applying
C227.3	Control the speed of DC motor using armature control and field control methods	Creating
C227.4	Predetermine the efficiency of transformers, DC shunt motor and assess their performance	Applying
C227.5	Obtain three phase to two phase transformation	Applying
C227.6	Obtain separation of losses of single-phase transformer and DC shunt motor	Applying
COURSE NAME: Electronics Devices & Circuits Laboratory(C228) **Faculty Name: D SURIBABU**		
C228.1	Explain about analog meters, digital meters, RPS, DMM and CRO.	Understanding
C228.2	Utilize the voltage and current relationships of PN Diode and Zener diode.	Applying
C228.3	Construct and Develop efficiency and % regulations of Halfwave and Full wave rectifiers with and without filters.	Applying
C228.4	Identify and compare the characteristics of BJT, FET, SCR and UJT in different configurations.	Applying
C228.5	Construct the different amplifier circuits for BJT and FET.	Applying

Sl. No.	Regulatio	Year/Semester	Course code	Course Name
1	**R16**	**III／ I**	**C316**	**Electrical Machines-II Laboratory**
2			**C317**	**Control Systems Laboratory**
3			**C318**	**Electrical Measurements Laboratory**
4			**C319**	**IPR & Patents**

COURSE NAME: Electrical Machines-II Lab (C316) **Faculty Name: CHALADI SIVA GANGA BHAVANI**		
C316.1	Obtain the performance of three phase induction motor by conducting brake test	Evaluating
C316.2	Compute the Equivalent Circuit parameters of three phase & single-phase Induction Motors	Applying
C316.3	Obtain the control of speed of three phase induction motor.	Applying
C316.4	Predetermine the regulation of three–phase alternator by various methods.	Applying
C316.5	Determine the X_d/ X_q ratio of alternator and asses the performance of three–phase synchronous motor	Applying
C316.6	Evaluate the power factor improvement of single-phase induction motor	Applying

COURSE NAME: Control Systems Lab(C317) **Faculty Name: I Vamsi Ram**		
C317.1	Model the transfer function of physical systems, determination of overall function using block diagram algebra and signal flow graphs.	Applying
C317.2	Determine the time response specifications of second order systems and to estimate error constants.	Evaluating
C317.3	Able to design Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram	Creating
COURSE NAME: Electrical Measurements Laboratory(C318) **Faculty Name: P SIVA PRASAD**		
C318.1	Calibrate single phase energy meter, power factor meter	Applying
C318.2	calibrate watt meter and energy meter	Applying
C318.3	Measurement of choke coil parameters	Applying
C318.4	Testing of transformer oil by using H.T test kit	Applying
C318.5	Measurement of resistance by using kelvin double bridge	Applying
C318.6	Measurement of capacitance by using Schering bridge	Applying

COURSE NAME: IPR & Patents (C319) Faculty Name: A Radha		
C319.1	Interpret the Concept of IPR Importance and mechanisms.	Understanding
C319.2	Utilize knowledge regarding copyrights to get them registered.	Applying
C319.3	Identify the filing procedure of patents and role of Patent Cooperation Treaty.	Applying
C319.4	Analyze rights and responsibilities of holder of Trademarks and Likelihood of Confusion - Dilution of Ownership.	Analyzing
C319.5	Illustrate the concepts of trade secrets and cyber laws.	Understanding

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	**R16**	**III / II**	**C326**	**Power Electronics Laboratory**
2			**C327**	**Microprocessors and Microcontrollers Lab**
3			**C328**	**Data Structures Lab**
4			**C329**	**Professional ethics & human values**

COURSE NAME: Power Electronics Lab(C326) Faculty Name: DURGA DEVI KONA		
C326.1	Able to Understand the Characteristics of Thyristor, MOSFET & IGBT.	Analyzing
C326.2	Able to Design and development of a firing circuits for Thyristor and IGBT.	Evaluating
C326.3	Able to Investigate the performance of Single -Phase Half controlled and Full controlled converter with R and RL load	Evaluating
C326.4	Able to describe the performance of AC Voltage Regulator and square wave bridge inverter with R and RL Loads	Creating
C326.5	Able to Verify the voltage gains of Boost converter and buck converter in CCM & DCM operation.	Applying

COURSE NAME: Microprocessors and Microcontrollers Lab (C327) **Faculty Name: Mr. M V V S N MURTHY**		
C327.1	Understand the fundamentals of assembly level programming of microprocessors microcontrollers knowledge	Understanding
C327.2	Apply the programming knowledge for arithmetic and logical operations in 8086	Applying
C327.3	Develop the programs for string manipulation programs Application	Applying
C327.4	Contrast how different I/O devices can be interfaced to processor and will explore several techniques of interfacing	Analyzing
C327.5	Apply the programming knowledge for understanding of communication standards in 8051	Applying
COURSE NAME: Data Structures Lab(C328) **Faculty Name: M L Rekha**		
C328.1	Describe the basic concepts of data structures and algorithms. (Remembering).	Understanding
C328.2	Interpret arrays, stack, queue operations and applications (Understanding)	Analyzing
C328.3	Select the appropriate data structure choosing given problem (Applying)	Evaluating
C328.4	Solve problem involving trees (Applying)	Creating
C328.5	Analyze different paths algorithms related graphs. (Analyzing)	Analyzing
C328.6	Apply Algorithm for solving problems like sorting, searching (Applying)	Creating

COURSE NAME: Professional Ethics & Human Values (C329) **Faculty Name: A Radha**		
C329.1	Define the basic insights and inputs to the student on ethics, values,morals,	Remembering
C329.2	Explain the ethical responsibilities of engineers.	Understanding
C329.3	Demonstrate the knowledge on engineering as a social experimentation.	Understanding

C329.4	Create the awareness about safety, risk, risk benefit analysis.	Creating
C329.5	Develop knowledge about global issues and environmental ethics.	Creating

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	R16	IV/I	C417	Electrical Simulation Laboratory
2			C418	Power systems & Simulation Laboratory

COURSE NAME: Electrical Simulation Lab(C417)		
Faculty Name: V VENKATESH		
C417.1	To simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.	Applying
C417.2	To simulate transmission line by incorporating line, load and transformer models.	Evaluating
C417.3	To perform transient analysis of RLC circuit and single machine connected to infinite bus (SMIB).	Evaluating
COURSE NAME: Power systems & Simulation Lab(C418)		
Faculty Name: S S C Prakash		
C418.1	Apply software packages like MATLAB/Simulink and PSCAD for power systems	Applying
C418.2	Determine positive, negative and zero sequence systems and fault analysis	Understanding
C418.3	Determine the dielectric strength of transformer oil using HV testing kit and calibrate the Tong tester	Applying
C418.4	Determine power flow solutions by using different methods.	Applying
C418.5	Analyze the performance of transmission lines.	Analyzing
C418.6	Analyze the different power system components under fault condition.	Analyzing

Sl. No.	Regulation	Year / Semester	Course	Course Name
1	R16	IV/II	C425	Seminar
2			C426	Project

COURSE NAME: Seminar (C425)		
Faculty Name: K Durga Devi		
C425.1	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts	Applying
C425.2	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources	Evaluating
C425.3	Student can apply and simulate the result by using different software or possible extend that result as a prototype	Applying
C425.4	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.	Applying
C425.5	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel.	Evaluating

Project Course Outcomes:

Project work done by the students in the final semester of the degree typically applies many Course outcomes attained by them in previous semesters. Each project guide frames the specific outcomes expected from the project. As guideline, following outcomes are taken for the Project.

COURSE NAME: Project (C426)		
Faculty Name: S S C Prakash		
C426.1.	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts.	Applying
C426.2.	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources.	Evaluating
C426.3.	Student can apply and simulate the result by using different software or possible extend that result as a prototype.	Applying

C426.4.	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.	Applying
C426.5.	Compare the result of their work to improve the quality of work.	Evaluating
C426.6.	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel.	Creating

4. ASSESSMENT OF COURSE OUTCOMES

4.1 Introduction

Assessment is a mechanism for providing instructors with data for improving their teaching methods and for guiding and motivating students to be actively involved in their own learning. As such, assessment provides important feedback to both instructors and students. The techniques of outcomes assessment as a means of measuring student learning and the use of that information to improve teaching are considered first.

Assessment gives us essential information about what our students are learning and about the extent to which we are meeting our teaching goals. The following three tools are used to assess the Course outcomes

1. Internal Tests
2. University Results
3. Course Outcome Feedback

Assessment of attainment of Course outcomes is done by Direct Methods and Indirect methods

(R-16 Regulation)

Type	Direct Methods of Assessment		Indirect methods of Assessment
	Internal	External	
Theory Courses	Mid Examinations, Quiz,Assignments	Semester End Examination	Course End Feedback
Laboratory Courses	Day to Day Work, Record, Internal Examination	Semester End Examination	Course End Feedback
Main Project	Project Synopsis, Midterm Evaluation, Internal Project Evaluation	Semester End Project Evaluation	NA

4.2 COs Assessment Process-Theory Courses:

The attainment process of COs is taken from three assessment Tools-Internal Tests, University Results, and Course Outcome Feedback. Internal Tests, University Results comes under direct attainment and Course Outcome Feedback comes under indirect attainment.

For assessment of attainment of Course Outcomes, 80% weightage is given to Direct Assessment and 20% weightage is given to Indirect Assessment.

Direct Method:

Evaluation	Exam	Maximum Marks	Frequency	Duration
Internal	MID (Descriptive)	15	Twice per semester	90 Minutes
	Objective(Multiple choice questions)	10	Twice per semester	20 Minutes
	Assignments	5	Six per Semester	
	Internal assessment (30 marks) = The 80% of the best of two tests + 20% of the least of two tests will be taken for internal marks			
External		70	Once per Semester	3 Hours

Procedure for Assessment Tool -Internal Tests:

As per the Curriculum of JNTU Kakinada, the student must write two internal examinations per the Course. Each exam conducted for 15 Marks. First three Units in MID –I and last three units syllabus covered in MID-II. Faculty will set the Question paper accordingly. The marks obtained for each question and corresponding CO are collected from each student and then CO attainment is calculated.

The course outcomes are written by the respective faculty member using action verbs of learning levels. Then, a correlation is established between COs and POs in the scale of 1 to 3, 1 being the slight (low), 2 being moderate (medium) and 3 being substantial (high). A mapping matrix is prepared in this regard for every course in the program

In a university affiliated college, the CO attainment levels can be measured based on the results of the internal assessment and external examination conducted by the university. This is a form of direct measurement of attainment. As per university regulations two internal assessment tests are conducted for each course in a semester. In each test, the percentage of

students who achieve a set target (usually, 50% of the maximum marks,) in each question calculated and that value decides the level of attainment of COs which correlated to that question. The model MID exam CO attainment form is given in Annexure-I (Form 1)

Attainment Level 1: below 55% of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 2: 55% to 80 % of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 3: more than 80% of students score more than 50% marks out of the maximum relevant marks.

Thus, the average of percentage of students attaining all the COs decides the CO attainment level.

Internal Tests analysis: POWER SYSTEM OPERATION & CONTROL (IV B. TECH I SEM)

CO Code	Course Outcome	CO attainment
C413.1	Compute optimal scheduling of Generators.	1.98
C413.2	Elaborate hydrothermal scheduling	1.79
C413.3	Discuss the unit commitment Problem	1.91
C413.4	Distinguish the load frequency control for single area system with and without controllers	1.66
C413.5	Contrast the load frequency control for two area system with and without controllers	1.66
C413.6	Explore reactive power control in power systems and compensation of transmission lines	2.13

Assessment Tool - University Results:

At the end of the Semester University conducts examination for 70 marks. The marks obtained for each student is calculated to measure the attainment. After the declaration of the university results, the percentage of students who attained the COs is computed. Here, it is assumed that the questions answered by a student cover all the course outcomes defined for that course. The percentage of students who achieve a set target (usually, 50% of the maximum marks,) calculated and that value decides the level of attainment of COs which correlated to that question.

Attainment Level 1: below 55% of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 2: 55% to 80 % of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 3: more than 80% of students score more than 50% marks out of the maximum relevant marks.

CO Feedback methodology

The true power of assessment comes in also using it to give feedback to our students. Improving the quality of learning in our courses involves not just determining to what extent students have mastered course content at the end of the course; improving the quality of learning also involves determining to what extent students are mastering content throughout the course.

At the end of the course, online feed backs are collected based on COs. Each CO is asked as question and that questionnaire has been send to Student. For example, if a course has six COs then six questions asked. The student may grade Excellent, Very Good, Good, Satisfactory and Poor. Their weightage are as follows.

Feed back	CO Attainment	Level of attainment
Excellent	% CO attainment > 80	Level 3
Very Good	70 < % CO attainment < 80	Level 2
Good	60 < % CO attainment < 70	
Satisfactory	50 < % CO attainment < 60	
Poor	% CO attainment < 50	Level 1

The model feedback CO attainment form is given in Annexure-III

Course Outcome Feedback weightage

Assessment Methods with weightage	**Level-1 (<60%)**	**Level-2 (60-80%)**	**Level-3(>80%)**
Course Outcome Feedback (20%)	No. of students selected the option "**Satisfactory** or **Poor**"	No. of students selected the option " **Very Good** or **Good**"	No. of students selected the option " **Excellent**"

Overall attainment calculation:

For the assessment of Course Outcomes attainments 80% weightage is given to Direct Assessment and 20% weightage is given to Indirect Assessment.

Direct attainment =80% of (65% of CO attainment level in Internal tests +
35% of CO attainment level in university test)

In Direct attainment= 20% of CO attainment level in CO feed back

Overall Course Outcome Attainment

The overall CO attainment level in the course considered is then computed as

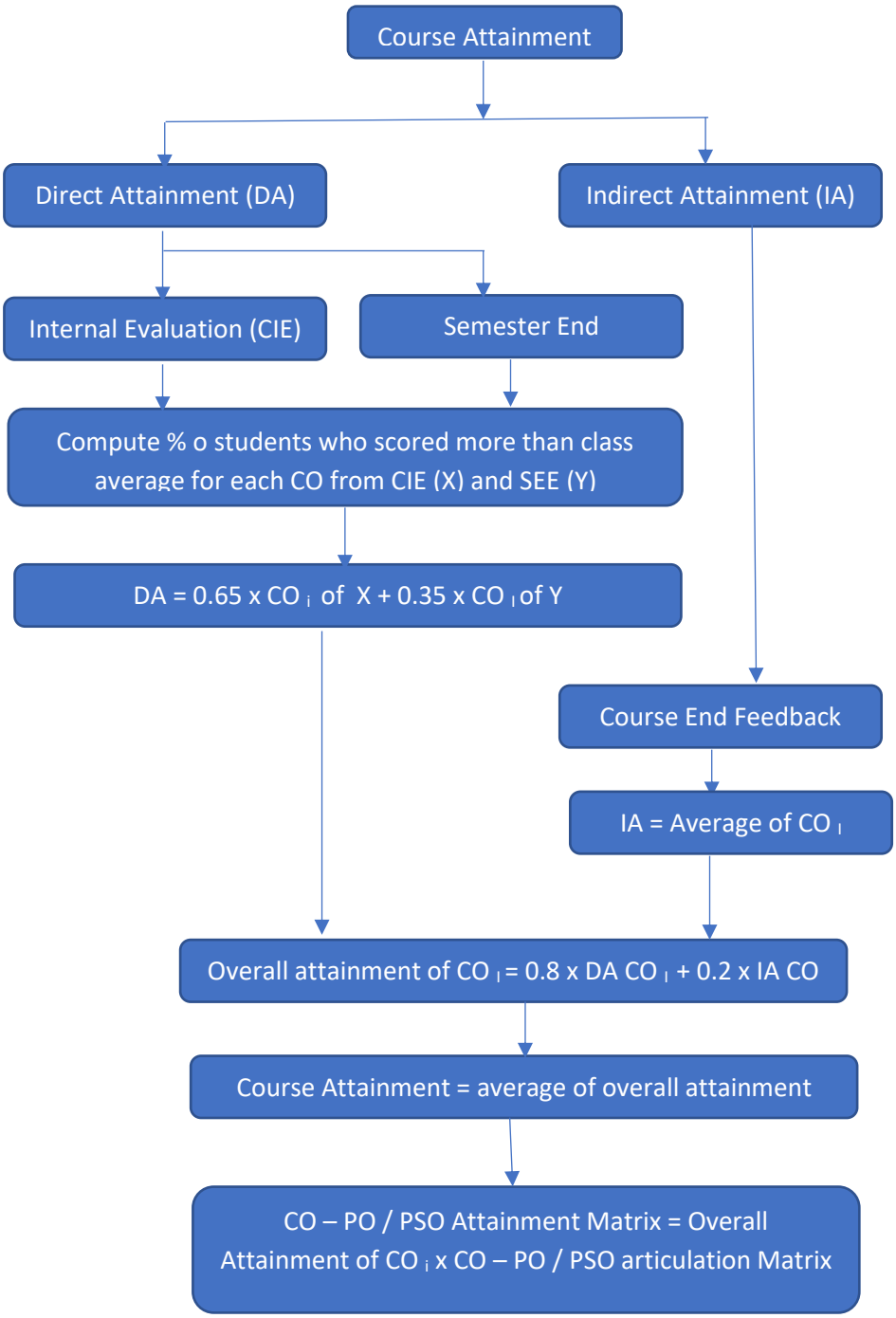
CO Assessment process is done based on the performance of the student using Direct Method (MID exam, Assignment, Semester End Examination) and Indirect Method (Course Semester End Feedback)

Overall CO attainment level= 80% of (65% of CO attainment level in Internal tests +
35% of CO attainment level in university test) +
20% of CO attainment level in CO feed back

Overall CO attainment level = 1.74x0.8 + 2.24 x0.2= 1.84.

Level	**Percentage attained**
Level 1	<55%
Level 2	55-80%
Level 3	>80%

The above procedure of computing overall CO attainment is to be repeated for each course from first year to final year in an academic year (including opted electives, project work and technical seminars in final year)



Overall CO attainment analysis: ***POWER SYSTEM OPERATION & CONTROL (IV B. TECH I SEM)***

CO Code	CO Feedback Rating (20 %)	Internal Assessment Rating (65%)	University Assessment Rating (35%)	Overall Attainment (100%)	Remarks
C413.1	2.55	1.75	2	1.98	**Level 2**
C413.2	2.24	1.50	2	1.79	**Level 6**
C413.3	2.2	1.75	2	1.91	**Level 1**
C413.4	2.25	1.25	2	1.66	**Level 3**
C413.5	2.23	1.25	2	1.66	**Level 5**
C413.6	1.99	2.25	2	2.13	**Level 6**
Average	2.24	1.62	2	**1.84**	

The same procedure is followed for all courses and data collected in single table.

4.3. Laboratory Course attainment Procedure:

Out of 75 marks for each lab, 25 marks are internal and 50 marks are for External Examination. In internal 25 marks, 10 marks for Day-to-day evaluation ,5 marks for completing the Laboratory record and 10 marks for Internal examination. By recording all their marks for each student, the CO attainment is calculated. The calculation process as follows Day to day evaluation (20%), completing the laboratory record lab (10%), Internal Exam (20%), External Exam (50%) and Total 100%. The model Lab CO attainment form is given below

Level	Percentage attained
Level 1	<=60% STUDENTS
Level 2	60 TO 80% STUDENTS
Level 3	>=80% MARKS

Rubrics of evaluation for Laboratory Exam Evaluation:

Evaluation	Mode of Evaluation	Maximum Marks	Frequency	Duration
Internal	Day-to-Day work	10	Once per Experiment	3 Hours
	Laboratory Record	5	Once per Experiment	
	Internal Exam	10	Once per Semester	1 Hour
External	External Exam	75	Once per Semester	3 Hours

Rubrics used for day-to-day Evaluation

Parameters	Allocated Marks	Poor	Average	Good
Preparation	4	Students preparation in observation book is insufficient	Students preparationin observation bookis Fair	Students preparationin observation bookis Good
		0-2 Mark	3 Marks	4 Marks
Execution	4	Not executed	Partially executed	Completely executed
		0 Mark	1-3 Marks	4 Marks
Viva Voce	2	No sufficient basic knowledge of the experiment	Demonstrating understanding of the experiment	Demonstrating good understanding of the experiment
		0 Mark	1 Marks	2 Marks

Rubrics used for laboratory record work

Parameters	Allocated Marks	Poor	Average	Good
Record	5	Insufficient recordingof content, evaluation& conclusion	Fair recording of content, evaluation & conclusion	Good recording of content,evaluation & conclusion
		0-2 Mark	3 - 4 Marks	5 Marks

Rubrics used for Laboratory Internal Examination

Parameters	Allocated Marks	Poor	Average	Good
Circuit diagram & Procedure writeup	4	Student was not able towrite procedure	Student was able towrite the procedurebut not able to show calculations	Student was able towrite the procedureand also able to show calculations
		0-2 Mark	3 Marks	4 Marks
Execution	4	Not executed	Partially executed	Completely executed
		0 Mark	1-3 Marks	4 Marks
Viva Voce	2	No sufficient basic knowledge of the experiment	Demonstrating understanding of the experiment	Demonstrating good understanding of the experiment
		0 Mark	1 Marks	2 Marks

Assessment of Electrical Machines-II Lab:

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

LAB COURSE ASSESSMENT

Lab Course Name:	ELECTRICAL MACHINES -II LABORATORY	Academic Year:	2020-21
Faculty Name:	CHALADI SIVA GANGA BHAVANI	Year & Semester:	III-1
Course Code:	C316 (R1631026)	Branch & section:	EEE-A&B

		Experiment Wise Assessment																		
S. No	ROLL NO	1	2	3	4	5	6	7	8	9	10	11	12	Lab Internal Exam	Day to day	Record	Observation	Total	End Semester grade	Grade Point
	Maximum Marks	10	10	10	10	10	10	10	10	10	10	10	10	10	5	5	5	25	O	10
1	18H41A0201			8										8	2	3	3	16	C	6
2	18H41A0202					9								9	5	4	4	22	O	10
3	18H41A0203						10							9	5	4	5	23	O	10
4	18H41A0204								10					10	5	5	5	25	O	10
5	18H41A0205																	0		
6	18H41A0206		5											5	3	3	3	14	B	7
7	18H41A0207				9									9	4	3	4	20	B	7
8	18H41A0208									9				9	5	4	4	22	S	9
9	18H41A0209							9						9	5	5	5	24	S	9
10	18H41A0210										9			9	5	5	5	24	O	10
11	18H41A0211												9	9	3	3	4	19	A	8
12	18H41A0212											9		9	5	5	5	24	O	10
13	18H41A0213		9											9	5	5	5	24	O	10
14	18H41A0214					3								3	2	2	1	8		FALSE
15	18H41A0215				9									9	4	5	4	22	S	9
16	18H41A0216						9							9	4	4	4	21	A	8
17	18H41A0217										9			9	5	5	4	23	S	9
18	18H41A0218								9					9	5	5	4	23	S	9
19	18H41A0219																	0		
20	18H41A0220											9		9	4	5	4	22	O	10
21	18H41A0223							10						10	5	5	5	25	O	10
22	18H41A0224			10										10	5	5	5	25	O	10
23	18H41A0225	10												10	5	5	5	25	O	10

24	18H41A0226											7	7	4	3	3	17	B	7
25	18H41A0227																0		FALSE
26	18H41A0228	9											9	5	5	4	23	O	10
27	18H41A0229		9										9	4	5	4	22	S	9
28	18H41A0230					9							9	3	3	4	19	A	8
29	18H41A0231				9								9	5	4	5	23	O	10
30	18H41A0232									9			5	2	2	3	12	ABSENT	ABSENT
31	18H41A0233								9				9	5	4	5	23	S	9
32	18H41A0234											9	9	5	4	5	23	O	10
33	18H41A0235											9	9	5	5	5	24	O	10
34	18H41A0236										9		9	5	5	5	24	O	10
35	18H41A0237							9					5	3	1	2	11	ABSENT	ABSENT
36	18H41A0238						9						9	5	5	5	24	O	10
37	18H41A0239						9						9	5	5	5	24	O	10
38	18H41A0240									10			9	5	4	5	23	O	10
39	18H41A0241											6	6	4	4	4	18	A	8
40	18H41A0242											5	5	2	2	3	12	ABSENT	ABSENT
41	18H41A0243										10		10	5	5	5	25	O	10
42	18H41A0244								5				5	4	3	4	16	F	0
43	18H41A0245					9							9	5	5	5	24	O	10
44	18H41A0246			5									5	2	2	2	11	ABSENT	ABSENT
45	18H41A0247	6											6	3	4	4	17	A	8
46	18H41A0248		9										9	5	5	5	24	O	10
47	18H41A0249				3								3	2	2	3	10	ABSENT	ABSENT
48	18H41A0250						10						10	5	5	5	25	O	10
49	18H41A0251		10										10	5	5	5	25	O	10
50	18H41A0252				10								10	5	5	5	25	O	10
51	18H41A0253					10							10	5	5	5	25	O	10
52	18H41A0254						9						9	5	5	5	24	S	9
53	18H41A0255							9					9	5	4	5	23	O	10
54	19H45A0201							9					9	5	4	5	23	O	10
55	19H45A0202									10			10	5	5	5	25	O	10
56	19H45A0203			9									9	5	4	5	23	O	10
57	19H45A0204	9											9	5	4	5	23	O	10
58	19H45A0205										9		9	5	5	5	24	O	10
59	19H45A0206											9	9	5	5	5	24	O	10
61	19H45A0208		10										10	5	5	5	25	O	10
62	19H45A0209				8								8	4	4	4	20	S	9
63	19H45A0210						9						9	5	4	5	23	O	10
64	19H45A0211							9					9	5	4	5	23	O	10
65	19H45A0212								9				9	5	5	4	23	O	10
66	19H45A0213										10		10	5	5	5	25	O	10
67	19H45A0214											9	9	5	4	4	22	S	9
68	19H45A0215									3			3	2	1	2	8	ABSENT	ABSENT
69	19H45A0216								6				6	3	3	3	15	ABSENT	ABSENT
70	19H45A0217				9								9	5	5	5	24	O	10
71	19H45A0219					9							9	4	4	5	22	O	10
72	19H45A0220			10									10	5	5	5	25	O	10
73	19H45A0221	9											9	5	5	5	24	O	10
74	19H45A0222		10										10	5	5	5	25	O	10
75	19H45A0223	9											9	5	5	5	24	O	10
76	19H45A0224				7								7	4	3	4	18	A	8
77	19H45A0225						10						10	5	5	5	25	O	10
78	19H45A0227					9							9	5	5	4	23	S	9
79	19H45A0228							10					10	5	5	5	25	O	10
80	19H45A0229								9				9	5	5	5	24	O	10
81	19H45A0230							9					9	4	4	4	21	A	8
82	19H45A0231									9			9	5	5	4	23	O	10
83	19H45A0232										10		10	5	5	5	25	O	10
Class Average Mark		8.7	8.9	8.4	8.0	8.3	9.3	9.4	8.6	8.8	8.3	8.9	8.0	8.5	4.4	4.2	4.4	20.8		9.3
Student Scored above average mark		5	6	3	6	6	2	3	7	5	6	6	4	64	55	44	47	61		49
Students Done the Experiment		6	7	5	8	7	6	7	8	6	7	7	6	80	80	80	80	83		72
% students scored above average mark		83	86	60	75	86	33	43	88	83	86	86	67	80	69	55	59	73		68
Attainment level		3	3	2	2	3	1	1	3	3	3	3	2	3	2	1	1	2		2

																Internal	Univ. Exam	Overall	CO Attainment from Feedback	Overall CO Attainment
C316.1	3											3	2	1	1	2.25	2.00	2.16	2.23	2.18
C316.2		3	2	2		1					3		2	1	1	2.00	2.00	2.00	2.23	2.05
C316.3					3								2	1	1	2.00	2.00	2.00	2.23	2.05
C316.4								3	3				2	1	1	2.25	2.00	2.16	2.23	2.18
C316.5										3			2	1	1	2.00	2.00	2.00	2.23	2.05
C316.6							1				2		2	1	1	1.50	2.00	1.68	2.23	1.79
																Overall Course attainment				2.05
																Set target for course attainment				1.60
																Status of the course attainment (Yes/No)				Yes

LAB COURSE OUTCOMES	
C316.1	Obtain the performance of three phase induction motor by conducting brake test
C316.2	Compute the Equivalent Circuit paramerters of three phase & single phase Induction Motors
C316.3	Obtain the control of speed of three phase induction motor.
C316.4	Predetermine the regulation of three–phase alternator by various methods.
C316.5	Determine the Xd/ Xq ratio of alternator and asses the performance of three–phase synchronous motor
C316.6	Evaluate the power factor improvement of single phase induction motor

Base Target taken for CO:	C316.1	Class average Mark	
Rubrics:			
>80% students	3		
80 to 60% students	2		
60 % students	1		

Reason for low attainment:	1	
	2	
	3	

Plan of Action for improvement	1	Students have to improve their practical Knowledge
	2	Determining Model Calculations perfectly

4.4. Project attainment Procedure:

Commonly six COs are given to each project and first two COs are evaluated in Review I, second two COs are evaluated in Review 2 and Last Two are evaluated in Review 3 by PRC for 20 marks each and from three reviews total 60marks. University will conduct external viva voce for 140marks. The average of Review -1, Review-2, Review-3, and University Viva voce is calculated. By considering 25% weightage to internal reviews and 75% weightage to University Viva voce marks total percentage of attainment is calculated.

Attainment Level 1: Attainment is less than 45%

Attainment Level 2: Attainment is in between 45% to 60 %

Attainment Level 3: Attainment is more than 60%

Marks will be carried out according to rubrics given below

Review#	Agenda	Assessment	Marks Assigned	Overall Marks
Review1	Project Synopsis / Proposal Evaluation	Rubric R1	5% (10M)	30% (60M)
Review 2	Mid-Term Project Evaluation	Rubric R2	12.5% (25M)	
Review 3	End Semester Project Internal Evaluation	Rubric R3	12.5% (25M)	
External Evaluation			70% (140M)	70% (140M)
Total			100% (200M)	100% (200M)

Rubrics used for Main Project

Review	Parameter	Rubric			Marks Weightage	
		Good	Average	Poor	%	Marks
Review 1	Project Synopsis / Proposal Evaluation	Objectives are well definedand survey of Literature is good. (7-10M)	Objectives are clear and survey of Literature is moderate.(4-6M)	Objectives and survey of Literature need improvement. (1-3M)	5	10
Review 2	Mid-Term Project Evaluation	Proposed methodology and the Progress of Project are good. (18-25M)	Proposed methodology and the Progress of Project are Satisfactory. (9-17M)	Proposed methodology and the Progress of Project need improvement. (0-8M)	12.5	25
Review 3	End Semester Project Evaluation	• Contents of presentation are appropriateand well arranged. • Communication skills are effective. • Conclusions are well drawn. (18-25M)	• Contents of presentation are appropriate. • Communication skills are average. • Conclusions are sufficiently drawn. (9-17M)	• Contents of presentation are inappropriate. • Communicationskills are poor. • Conclusions are not satisfactory. (0-8M)	12.5	25

The model Project- CO attainment form is given below:

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Assessment			
Course Name:	**PROJECT**	Academic Year:	2021-22
Faculty Name:	CHALADI SIVA GANGA BHAVANI	Year & Semester:	IV Year II Semester
Course Code:	R1642026	Branch & section:	EEE-A&B

S. No	ROLL NO	1st Review	2nd Review	3rd Review	Internal	End Semester grade	Grade Points
Maximum Marks		**20**	**20**	**20**	**60**	**O**	10
1	18H41A0201	17	17	18	**52**	S	9
2	18H41A0202	19	19	20	**58**	O	10
3	18H41A0203	17	18	19	**54**	O	10
4	18H41A0204	20	20	20	**60**	O	10
5	18H41A0206	18	18	19	**55**	S	9
6	18H41A0207	18	19	19	**56**	S	9
7	18H41A0208	19	19	20	**58**	S	9
8	18H41A0209	20	20	20	**60**	O	10
9	18H41A0210	20	20	20	**60**	O	10
10	18H41A0211	18	19	19	**56**	O	10
11	18H41A0212	20	20	20	**60**	O	10
12	18H41A0213	20	20	20	**60**	O	10
13	18H41A0215	16	17	17	**50**	S	9
14	18H41A0216	16	18	18	**52**	S	9
15	18H41A0217	16	17	17	**50**	S	9
16	18H41A0218	15	15	15	**45**	S	9
17	18H41A0220	18	19	19	**56**	O	10
18	18H41A0223	19	19	20	**58**	O	10
19	18H41A0224	19	19	20	**58**	O	10
20	18H41A0225	19	19	20	**58**	O	10
21	18H41A0226	15	15	16	**46**	S	9
22	18H41A0228	17	18	19	**54**	S	9
23	18H41A0229	18	19	19	**56**	S	9
24	18H41A0230	16	17	17	**50**	S	9
25	18H41A0231	18	19	19	**56**	S	9
26	18H41A0232	16	17	17	**50**	S	9
27	18H41A0233	16	17	17	**50**	S	9
28	18H41A0234	20	20	20	**60**	O	10
29	18H41A0235	18	19	19	**56**	S	9

30	18H41A0236	18	19	19	**56**	O	10
31	18H41A0237	16	16	16	**48**	S	9
32	18H41A0238	20	20	20	**60**	O	10
33	18H41A0239	18	19	19	**56**	O	10
34	18H41A0240	20	20	20	**60**	O	10
35	18H41A0241	16	17	17	**50**	S	9
36	18H41A0242	15	15	16	**46**	S	9
37	18H41A0243	20	20	20	**60**	O	10
38	18H41A0244	15	15	16	**46**	S	9
39	18H41A0245	18	18	18	**54**	S	9
40	18H41A0246	16	17	17	**50**	S	9
41	18H41A0247	16	17	17	**50**	S	9
42	18H41A0248	20	20	20	**60**	O	10
43	18H41A0249	16	16	16	**48**	S	9
44	18H41A0250	20	19	19	**58**	O	10
45	18H41A0251	17	18	19	**54**	S	9
46	18H41A0252	20	20	20	**60**	O	10
47	18H41A0253	20	19	19	**58**	O	10
48	18H41A0254	20	19	19	**58**	S	9
49	18H41A0255	16	18	18	**52**	S	9
50	19H45A0201	17	18	19	**54**	S	9
51	19H45A0202	20	20	20	**60**	O	10
52	19H45A0203	17	17	18	**52**	S	9
53	19H45A0204	20	19	19	**58**	O	10
54	19H45A0205	20	19	19	**58**	O	10
55	19H45A0206	20	20	20	**60**	O	10
56	19H45A0207	20	19	19	**58**	S	9
57	19H45A0208	20	19	19	**58**	O	10
58	19H45A0209	20	19	19	**58**	O	10
59	19H45A0210	18	19	19	**56**	O	10
60	19H45A0211	20	20	20	**60**	O	10
61	19H45A0212	18	19	19	**56**	S	9
62	19H45A0213	20	20	20	**60**	O	10

63	19H45A0214	17	17	18	**52**	S	9
64	19H45A0216	16	16	16	**48**	S	9
65	19H45A0217	20	19	19	**58**	O	10
66	19H45A0219	20	19	19	**58**	O	10
67	19H45A0220	17	18	19	**54**	S	9
68	19H45A0221	20	20	20	**60**	O	10
69	19H45A0222	20	19	19	**58**	O	10
70	19H45A0223				**0**		
71	19H45A0224	16	17	17	**50**	S	9
72	19H45A0225	20	20	20	**60**	O	10
73	19H45A0227	17	18	19	**54**	S	9
74	19H45A0228	20	20	20	**60**	O	10
75	19H45A0229	20	19	19	**58**	S	9
76	19H45A0230	17	18	19	**54**	S	9
77	19H45A0231	17	18	19	**54**	S	9
78	19H45A0232	20	20	20	**60**	O	10
Class Average Mark		18	18	19	55	O	9
Student Scored above average mark		36	46	55	47	77	38
Students attempted the question		77	77	77	78	77	77
% students scored above average mark		47	60	71	60	100	49
Attainment level		2	2	3	2	3	2

						University	
					Internal	**Exam**	**Overall**
C426.1	2			**2**	**2**	**2**	**2.00**
C426.2	2			**2**	**2**	**2**	**2.00**
C426.3		**2**		**2**	**2**	**2**	**2.00**
C426.4		**2**		**2**	**2**	**2**	**2.00**
C426.5			**3**	**2**	**2.5**	**2**	**2.15**

C426.6			**3**	**2**	**2.5**	**2**	**2.15**
Overall Course attainment							**2.05**
Set target for course attainment							**1.67**
Status of the course attainment (Yes/No)							**Yes**

C426.1	Applying	Student can be able to identify and solve the issues related to electrical engineering by using engineering concepts.
C426.2	Evaluating	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources
C426.3	Applying	Student can apply and simulate the result by using different software or possible extend that result as a prototype
C426.4	Applying	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.
C426.5	Evaluating	Compare the result of their work to improve the quality of work
C426.6	Creating	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel.

Base Target taken for CO:				Class average Mark			
Rubrics:							
>65% students			3				
50 to 65% students			2	Best performing Course Outcome:		C426.6	
<45 % students			1	Least performing Course Outcome:		C426.1	

Rubrics for Seminar

Review #	Agenda	Assessment	Review Assessment Weightage	Review Assessment Marks
Review1	Seminar Report Evaluation	Rubric R1	100%	50M

5. ASSESSMENT OF PROGRAM OUTCOMES

5.1 Introduction

In quality teaching and learning process, mapping and attainment is becoming an important process. The compliance of continuous improvement can be done by deciding action plan for weak attainment and is a key factor leading to continuous student learning.

Program Outcomes (POs) are one step broader statements than COs that describe what students are expected to know and be able to do upon graduation. These relate to the skills, knowledge, and behavior that students acquire in their matriculation through the program.

The program outcomes are assessed with the help of course outcomes of the relevant Courses through direct and indirect methods.

Direct Assessment Method:

Direct measures are provided through direct examinations or observations of student knowledge or skills against measurable course outcomes. The knowledge and skills described by the course outcomes are mapped to specific problems on internal exams/home assignment/group task. Throughout the semester the faculty records the performance of each student on each course outcome. At the end of the semester students receive grades from external exams.

Indirect Assessment Method:

Indirect assessment strategies are implemented by embedding them in the course end survey, Graduate survey and Alumni Survey. Finally, program outcomes are assessed wiabove mentioned data and Program Assessment Committee concludes the Po attainment level.

PO and PSO Assessment Rubrics

The Program Assessment committee decided to have the following PO Assessment methods for various POs,depending on the number of courses contributing to POs:

1. POs and PSOs having more than 50% Courses Contribution (PO1, PO2, PO3, PO5):

1	Assessment of Cos and their contributions to PO Attainment	80%
2	Student's exit Feedback, Alumni & Industries Feedback	20%

2. POs and PSOs having less than 50% Courses Contribution (PO4, PO6, PO7, PO8, PO9, PO10, PO11, PSO1, PSO2):

1	Assessment of Cos and their contributions to PO Attainment	60%
3	Students exit Feedback, Alumni & Industries Feedback	20%

4	Assessment of Students participation in Co-Curricular / Extra Curricular Activities & Contribution to PO Attainments	20%

5.2 CO-PO Mapping

- *POs are attained through the COs. So determine the POs corresponding set COs.*
- *Every Course Leads to Some Outcomes. All the courses together must cover all the POs (and PSOs).*
- *A PO can have contributors from many Cos*
- *POs are attained through the COs. So we determine the corresponding set COs.*
- *Every Course Leads to Some Outcomes. All the courses together must cover all the POs (and PSOs).*

While mapping COs with Pos the following points to be observed

- Is CO reflects the intended measurement from PO?
- Does the assessment correlates well with the CO?

Sample CO-PO mapping:

Step 1: form a Table between COs and POs with correlation by verifying the reasons

Sample Course outcomes:POWER SYSTEM OPERATION & CONTROL (IV B.TECH I SEM)

CO Code	Course Outcome	Taxonomy Level
C413.1	Compute optimal scheduling of Generators.	Understanding
C413.2	Elaborate hydrothermal scheduling	Creating
C413.3	Discuss the unit commitment Problem	Remembering
C413.4	Distinguish the load frequency control for single area system with and without controllers	Applying
C413.5	Contrast the load frequency control for two area system with and without controllers	Evaluating
C413.6	Explore reactive power control in power systems and compensation of transmission lines	Creating

Sample CO-PO mapping: POWER SYSTEM OPERATION & CONTROL (IV B.TECH I SEM)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C413.1	X	X	-	-	-	-	-	-	-	-	-	-	-	-
C413.2	X	X	-	-	-	-	-	-	-	-	-	-	-	-
C413.3	X	X	-	-	X	-	-	-	-	-	-	-	-	-
C413.4	X	X	-	-	X	-	-	-	-	-	-	-	-	X
C413.5	X	-	-	-	X	-	-	-	-	-	-	-	-	X
C413.6	X	X	-	-	X	-	-	-	-	-	-	-	-	-

Step 2: Depending on correlation level assign level of mapping at corresponding points.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C413.1	2	2	-	-	-	-	-	-	-	-	-	-	-	
C413.2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C413.3	2	2	-	-	2	-	-	-	-	-	-	-	-	-
C413.4	2	2	-	-	2	-	-	-	-	-	-	-	-	2
C413.5	2	-	-	-	2	-	-	-	-	-	-	-	-	2
C413.6	2	-	-	-	2	-	-	-	-	-	-	-	-	-
C413	2	2	-	-	2	-	-	-	-	-	-	-	-	2

Level of mapping - 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Step 3: Justification for the mapping of CO with the PO will be recorded.

A sample Justification Guidelines is shown below:

PROGRAM OUTCOMES (POs) Mapped with Cos:

Mapped POs: PO1, PO5

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

PO2. **PROBLEM ANALYSIS**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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.

C413.1 Compute optimal scheduling of Generator. (Understanding)

PO#	Mapping Level	Justification
PO1	3 (High)	student get the knowledge of Economic operation of power system
PO2	2 ((Medium)	students can able to solve the problems of Economic load dispatch with & without losses

C413.2: Elaborate hydrothermal scheduling. (Creating)

PO#	Mapping Level	Justification
PO1	3 (High)	students acquire knowledge of Hydro-Thermal system.
PO2	2 (Medium)	Students can solve the numerical problems on .Hydro-Thermal co-ordination.

C413.3. Discuss the unit commitment Problem (Analysing)

PO#	Mapping Level	Justification
PO1	3 (High)	Get the knowledge on unit commitment solution methods.
PO2	3 (High)	Easily evaluate problems on unit commitment.
PO5	2 (Medium)	Selecting appropriate techniques used in unit commitment

C413.4 : Distinguish the load frequency control for single area system with and without controllers.(Applying)

PO#	Mapping Level	Justification
PO1	3 (High)	Get the knowledge on load frequency controllers
PO2	2 (Medium)	Derive the mathematical modeling of generator, turbine &load
PO5	2 (Medium)	Applying real time application of Load Frequency Controllers
PSO2	2 (Medium)	Applying real time application of Load Frequency Controllers

C413.5: Contrast the load frequency control for two area system with and without controllers (Evaluating)

PO#	Mapping Level	Justification
PO1	2 (Medium)	Get the knowledge on single are control
PO5	2 (Medium)	Applying real time application of PI controllers
PSO2	3 (High)	Evaluate PI controllers using Mat lab

C413.6: Explore reactive power control in power systems and compensation of transmission lines (Creating)

PO#	Mapping Level	Justification
PO1	2 (Medium)	Get the knowledge on Reactive power control
PO2	2 (Medium)	Evaluate various compensating equipment
PO5	2 (Medium)	Illustrate compensation in transmission applications

All courses CO-PO mapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
English-I														
C111.1	2									2				
C111.2										2		2		
C111.3	2				3									
C111.4	2						3							
C111.5							2			2				
C111.6									3			2		
C111	2				3		2.5		3	2		2		
Mathematics I														
C112.1	3	2	1	1	-	-	-	-	-	-	-	-	-	-
C112.2	3	2	1	2	-	-	-	-	-	-	-	-	-	-
C112.3	2	2	2	1	-	-	-	-	-	-	-	-	-	-
C112.4	1	3	2	1	-	-	-	-	-	-	-	-	-	-
C112.5	2	3	1	2	-	-	-	-	-	-	-	-	-	-
C112.6	2	2	2	2	-	-	-	-	-	-	-	-	-	-
C112	2.17	2.33	1.50	1.50	-	-	-	-	-	-	-	-	-	-
Applied Chemistry														
C113.1	3	2	2	2										
C113.2	2	2	2			2	2							
C113.3	2	2	2	3	2									
C113.4	3	2	2											
C113.5	2	2												
C113.6	2	2			2									
C113	2.33	2	2	2.5	2	2	2							
Engineering Mechanics														
C114.1	3	2											2	
C114.2	3	2											2	
C114.3	3	3												2
C114.4	2	3												2
C114.5	2	2											2	

C114.6	3	3												2
C114	**2.67**	**2.5**											**2**	**2**
Computer Programming														
C115.1	-	3	2	-	-	-	-	-	-	-	-	-	-	-
C115.2	-	3	-	2	-	-	-	-	-	-	-	-	-	-
C115.3	-	3	3	-	-	-	-	-	-	-	-	-	-	-
C115.4	-	-	-	2	2	-	-	-	-	-	-	-	-	-
C115.5	3	-	2	-	-	-	-	-	-	-	-	-	-	-
C115.6	-	2	-	-	2	-	-	-	-	-	-	-	-	-
C115	3	2.75	2.33	2.00	2.00	-	-	-	-	-	-	-	-	-
Computer programming laboratory														
C119.1	3								2		2			
C119.2	2								2		2			
C119.3		3		3					2		2			
C119.4		3		3					2		2			
C119.5		2		2					2		2			
C119.6		3							2		2			
C119	2.5	2.67		2.67					2		2			
PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Mathematics- II														
C122.1	2	3	1											
C122.2	2	3	1											
C122.3	2	2	2											
C122.4	2	2	2											
C122.5	2	3	1											
C122.6	3	1	2											
C122	2.17	2.34	1.5											
Mathematics III														
C123.1	3	3	2											-
C123.2	3	3	1											-
C123.3	2	3	3											-
C123.4	2	3	1											-

C123.5	2	3	2											-
C123.6	3	3	2											
C123	2.5	3	1.84											
Applied Physics														
C124.1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C124.2	3	3	-	-	-	-	-	-	-	2	-	-	-	-
C124.3	3	2	-	-	-	-	-	-	-	2	-	-	-	-
C124.4	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C124.5	3	3	-	-	-	-	-	-	-	-	-	-	-	-
C124.6	3	2	2	-	-	-	-	-	-	-	-	-		
C124	3.00	2.33	2.00	-	-	-	-	-	-	2	-	-	-	-
Electrical Circuit Analysis-1														
C125.1	2	2												
C125.2	2	2			2									
C125.3	3	2												
C125.4	2	2	2											
C125.5	2	2	2											
C125.6	3	2	3		3									
C125	2.33	2	2.33		2.5									
Engineering Drawing														
C126.1	1			2						3			1	
C126.2				2						3			1	
C126.3				2						3			1	
C126.4				2						3			1	
C126.5				2						3			1	
C126.6	1			2						3			1	
C126	1			2						3			1	

PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Electrical Circuit Analysis-II														
C211.1	2	2	-		2									

C211.2	2	1	-		3									
C211.3	2	1	-											
C211.4	3	1	-	2										
C211.5	3	2	-											
C211.6	2	3	-											
C211	2.34	1.67	-	2.0	2.5		-	-	-	-	-	-	-	-
Electrical Machines-1														
C212.1	2	2	3											
C212.2	3	2	2											
C212.3	1	3	2											
C212.4	3	2												
C212.5	2	3												
C212.6	3	1	2											
C212	2.33	2.17	2.25											
Basic Electronics & Devices														
C213.1	2	3			1									
C213.2	3	1												
C213.3	2	3												
C213.4	3	3												
C213.5	3	2												
C213.6	3	2												
C213	2.67	2.33			1									
Electro Magnetic fields														
C214.1	2	3												
C214.2	2	3												
C214.3	2	2												
C214.4	2	3												
C214.5	2	3												
C214.6	2	2												

C214	**2.33**	**1.66**												
Thermal & Hydro Prime movers														
C215.1	2	2			2									
C215.2	2	1			3									
C215.3	2	1												
C215.4	3	1		2										
C215.5	3	2												
C215.6	2	3												
C215	2.33	1.66		2	2.5									
Managerial Economics and Financial Analysis														
C216.1	2	-	-	-	-	-	-	-	-	-	2	-	-	-
C216.2	-	3	-	-	-	-	-	-	-	-	2	-	-	-
C216.3	-	-	1	-	-	-	-	-	-	-		-	-	-
C216.4	2	-	-	-	-	-	-	2	-	-		-	-	-
C216.5	-	2	-	-	-	-	-	2	-	-		-	-	-
C216.6	-	1	-	-	-	-	-	-	-	-	2	-	-	-
C216	2	2	1	-	-	-	-	2	-	-	2	-	-	-

PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Electrical Measurements														
C221.1	3	2	1	2										
C221.2	3	2	2											
C221.3	2	3	2											
C221.4	2	3	2	3										
C221.5	3	3	2											
C221.6				1										
C221	2.6	2.6	1.8	2										
Electrical Machines-II														
C222.1	2	2			2									
C222.2	2	3			2									
C222.3	3	3			1									

C222.4	3	3			1									
C222.5	2	2			1									
C222.6	2				1									
C222	2.33	2.1			1.33									
Switching Theory & Logic Design														
C223.1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C223.2	3	3		-	-	-	-	-	-	-	-	-	-	
C223.3	3	-	3	-	-	-	-		-	-	-	-	-	-
C223.4	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C223.5	3	3	3	-	-	-	-	-	-	-	-	-	-	-
C223.6	-	3	2	-	-	-	-	-	-	-	-	-	-	
C223	3	2.75	2.67	-	-	-	-	-	-	-	-	-	-	-
Control Systems														
C224.1	2	3												
C224.2	3	3												
C224.3	2	2												1
C224.4	2	2			1									1
C224.5	3	3			2									1
C224.6	3	2			2									1
C224	2.5	2.5			1.67									1
Power Systems-1														
C225.1	3													
C225.2	3													
C225.3	2	3												
C225.4	2													
C225.5	2	3												
C225.6	3	2												
C225	2.5	2.67												
Management Science														
C226.1	-	2	-	-	-	-	-	-	3	-	-	-	2	-

C226.2	-	2	-	-	-	-	-	-	3	-	-	-	-	2
C226.3	-	-	-	-	-	-	-	1	3	-	-	-	2	-
C226.4	-	2	-	-	-	-	-	-		-	3	-	2	2
C226.5	-	-	-	-	-	-	2	-	3	-	-	-	2	-
C226.6	-	-	-	-	-	-	2	-	3	-	-	-	2	-
C226		2					2	1	3		3		2	2

PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Power Systems-II														
C311.1	2	2			1									
C311.2	3	2												
C311.3	2	1			2									
C311.4	3	2												
C311.5	2	2												
C311.6	2	2			2									
C311	2.3	1.8			1.7									
Renewable Energy Sources														
C312.1	2	2			2									
C312.2	2	1			3									
C312.3	2	1												
C312.4	3	1		2										
C312.5	3	2												
C312.6	2	3												
C312	2.33	1.66		2	2.5									
Signals & Systems														
C313.1	2	2		2										
C313.2	2	2	2											
C313.3	2	3												
C313.4	2	2		3										
C313.5	2	2	3											
C313.6	2													
C313	2.00	2.2	2.5	2.5										

Pulse & Digital Communication														
C314.1	2	3	2		2									1
C314.2	2	3	3		2									1
C314.3	2	3	2											1
C314.4	2	2	3		3							-		1
C314.5	2	2	3		2									1
C314.6	2	2	2		2									1
C314	2	2.5	2.5		2.2									1
Power Electronics														
C315.1	2	2	2	-	2	-	-	-	-	-	-	3	-	1
C315.2	2	2	2	-	2	-	-	-	-	-	-	-	1	2
C315.3	2	2	2	-	2	-	-	-	-	-	-	-	1	2
C315.4	2	2	2	-	2	-	-	-	-	-	-	-	1	2
C315.5	2	2	2	-	2	-	-	-	-	-	-	-	1	2
C315.6	2	2	2	-	2	-	-	-	-	-	-	-	1	2
C315	2	2	2		2							3	1	1.83
IPR & Patents														
C319.1	-	-	3	-	-	2	-	-	-	-	-	-	-	-
C319.2	-	-	3	-	-	2	-	-	-	-	-	-	-	-
C319.3	-	-	3	-	-	2	-	-	-	-	-	-	-	-
C319.4	-	-	3	-	-	2	-	-	-	-	-	-	-	-
C319.5	-	-	3	-	-	2	-	-	-	-	-	-	-	
C319.6	-	-	3	-	-	2	-	-	-	-	-	-	-	-
C319	-	-	3	-	-	2	-	-	-	-	-	-	-	-

PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Power Electronic Controllers & Drives														
C321.1	3													
C321.2	2	2	2										1	
C321.3	3	2	2										1	
C321.4	2	2	2										1	
C321.5	2	2	2										1	

C321.6	2	2	2										1	
C321	2.33	2	2										**1**	
Power System Analysis														
C322.1	1	1												
C322.2	2	1			2									2
C322.3	1	2			2									2
C322.4	2	1												
C322.5	2	2												
C322.6	1	1												
C322	1.5	1.3			2									2
Micro Processor & Micro Controllers														
C323.1	3	-	2	-	-	-	2	-	-	-	-	-	2	-
C323.2	1	3	-	-	2	-	-	-	-	-	-	-	2	-
C323.3	1	-	3	2	-	-	-	-	-	-	-	-	2	-
C323.4	3	2	-	2	-	-	-	-	-	-	-	-	2	-
C323.5	2	-	2	1	-	-	-	-	-	-	-	-	2	-
C323.6	2	-	3	-	2	-	-	-	-	-	-	-	2	-
C323	2	2.5	2.5	1.67	2		2						2	
Data Structures														
C324.1	1	2												
C324.2	2	3												
C324.3		2	3											
C324.4	3	2		2										2
C324.5			3	2										2
C324.6			2	3										2
C324	2	2.25	2.6	2.3										2
OOPS through Java														
C325.1	2	2	3		2				2		2	2		
C325.2	3	2	2						2					
C325.3	2	2	3		3	1			2			2		
C325.4	2	2	3	2	3				2	2		2		
C325.5	2	2	3	1	3				2			2		
C325.6	3	2	3	2	2				2	2	2	3		

C325	2.67	2.4	2.5	2.5	2.5									
Professional Ethics & Human Values														
C329.1	-	-	-	-	-	-	-	3	-	2	-	-	-	-
C329.2	-	-	-	-	-	-	-	3	-	2	-	-	-	-
C329.3	-	-	-	-	-	-	-	3	-	2	-	-	-	-
C329.4	-	-	-	-	-	-	-	3	-	2	-	-	-	-
C329.5	-	-	-	-	-	-	-	3	-	2	-	-	-	-
C329.6	-	-	-	-	-	-	-	3	-	2	-	-	-	-
C329	-	-	-	-	-	-	-	3	-	2	-	-	-	-

PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Utilisation of Electrical Energy														
C411.1	2	2			2									
C411.2	2	1			3									
C411.3	2	1												
C411.4	2	1		2										
C411.5	2	2												
C411.6	2	3												
C411	2	1.66		2	2.5									
Linear IC Applications														
C412.1	2	2	2	2										
C412.2	3	3	2	3										
C412.3	2	2	3	2										
C412.4	3	3	2	3										
C412.5	3	3	3	2										
C412.6	3	2	3	3										
C412	2.67	2.5	2.5	2.5										
Power System Operation & Control														
C413.1	2	2												
C413.2	2	2												
C413.3	2	2			2									
C413.4	2	2			2									2
C413.5	2				2									2

C413.6	2				2									
C413	2	2			2									2
Switch Gear & Protection														
C414.1	2	2												
C414.2	2	2												
C414.3	2	2			2									
C414.4	2	2			2									2
C414.5	2				2									2
C414.6	2				2									
C414	2	2			2									2
Instrumentation														
C415.1	3	2	1	2										
C415.2	2	2	2											
C415.3	2	2	1											
C415.4	2	2	1	3										
C415.5	2	2	2											
C415.6				1										
C415	2.2	2	1.4	2										
Electric Power Quality														
C416(a).1	2	2			3									
C416(a).2	2	2			3									
C416(a).3	3	2		2										
C416(a).4	3	2		3										
C416(a).5	3	2		2										
C416(a).6	2	3												
C416(a)	2.5	2.17		2.34	3									
Special Electric Machines														
C416(b).1	3	3	-	-	-	-	-	-	-	-	-	-	-	-
C416(b).2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C416(b).3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C416(b).4	2	2	-	-	2	-	-	-	-	-	-	-	-	-
C416(b).5	3	-	-	-	-	-	-	-	-	-	-	-	-	-

C416(b).6	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C416(b).1	2.66	2.33			2									

PO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
Digital Control Systems														
C421.1	2	2			2									
C421.2	2	3			2									
C421.3	2	1		2	2									
C421.4	2	2		2										
C421.5	3	2		2										
C421.6	2	2			2									
C421	2.16	2		1	1.3									
HVDC Transmission														
C422.1	2	2			2									
C422.2	2	3			2									
C422.3	2	3			1									
C422.4	2	3			1									
C422.5	2	2			1									
C422.6	2				1									
C422	2	2.1			1.34									
Electrical Distribution Systems														
C423.1	2	2												
C423.2	2	2			2									
C423.3	2	2			3									
C423.4	2	2			2									
C423.5	2	3												
C423.6	2	2												
C423	2	2.2			2.3									
High Voltage Engineering														
C424.1	2				2									
C424.2	2				2									
C424.3	2		2											

C424.4	2				2									
C424.5	2				2									
C424.6	2				2									
C424	2		2		2									

5.3 Courses Contributing each PO:

S. No	PO	Courses	No. of Courses mapped
1.	PO1	C111,C112,C113,C114,C115,C116,C117,C119,C121,C122,C123,C124,C125,C126,C128,C129,C1210,C211,C212,C213,C214,C215,C216,C217,C218,C221,C222,C223,C224,C225,C227,C228,C311,C312,C313,C314,C315,C316,C317,C318,C321,C322,C323,C324,C3252,C326,C327,C328,C411,C412,C413,C414,C4154,C4162,C417,C418,C421,C422,C423,C4241,C425,C426	62
2.	PO2	C112,C113,C114,C115,C116,C117,C119,C122,C123,C124,C125,C128,C129,C1210,C211,C212,C213,C214,C215,C216,C217,C218,C221,C222,C223,C224,C225,C226,C227,C228,C311,C312,C313,C314,C315,C316,C317,C318,C321,C322,C323,C324,C3252,C326,C327,C328,C411,C412,C413,C414,C4154,C4162,C417,C418,C421,C422,C423,C425,C426	59
3.	PO3	C112,C113,C115.C117,C122,C123,C124,C125,C129,C1210,C212,C216,C217,C218,C221,C223,C313,C314,C315,C317,C319,C321,C323,C324,C3252,C326,C327,C328,C412,C414,C4154,C417,C4241,C425,C426	35
4.	PO4	C112,C113,C115,C119,C126,C1210,C211,C215,C221,C223,C312,C313,C323,C324,C3252,C328,C411,C412,C414,C4154,C4162,C421,C426	23
5.	PO5	C111,C113,C115,C117,C118,C121,C125,C127,C128,C129,C1210,C211,C213,C215,C222,C223,C224,C311,C312,C314,C	37

		315,C321,C322,C323,C3252,C327,C411,C413,C4154,C4162, C418,C421,C422,C423,C4241,C425,C426	
6.	PO6	C113,C116,C117,C121,C319,C321,C3252,C426	8
7.	PO7	C111,C113,C116,C117,C121,C226,C323,C426	8
8.	PO8	C216,C226,C329,C426	4
9.	PO9	C111,C118,C119,C121,C127,C1210,C226,C227,C316,C318, C3252,C326,C327,C418,C425,C426	17
10.	PO10	C111,C118,C121,C124,C126,C127,C3252,C327,C329,C425, C426	11
11.	PO11	C119,C1210,C216,C226,C3252,C426	6
12.	PO12	C111,C118,C121,C127,C315,C3252,C426	7
13.	PSO1	C114,C116,C117,C126,C128,C211,C212,C226,C228,C315,C 321,C323,C326,C327,C412,C418,C425	17
14.	PSO2	C114,C124,C129,C212,C224,C226,C314,C315,C317,C321,C 322,C324,C326,C328,C412,C413,C418,C425,C426	19

5.4 PO attainment from Theory Course

The process of attainment of POs starts from writing appropriate COs for each course of the program. The course outcomes are written by the respective faculty member using action verbs of learning levels. Then, a correlation is established between COs and POs in the scale of 1 to 3, 1 being the slight (low), 2 being moderate (medium) and 3 being substantial (high). A mapping matrix is prepared in this regard for every course in the program.

Program outcomes and 'program specific outcomes' are attained through the attainment of COs. This is called direct attainment of POs.

In a university affiliated college, the CO attainment levels can be measured based on the results of the internal assessment and external examination conducted by the university. This is a form of direct measurement of attainment. As per university regulations two internal assessment tests are conducted for each course in a semester. In each test, the percentage of students who achieve a set target (usually, 50% of the maximum marks,) in each question

calculated and that value decides the level of attainment of COs which correlated to that question.

Attainment Level 1: below 60% of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 2: 60% to 80 % of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 3: more than 80% of students score more than 50% marks out of the maximum relevant marks.

Thus, the average of percentage of students attaining all the COs decides the CO attainment level.

After the declaration of the university results, the percentage of students who attained the COs is computed. Here, it is assumed that the questions answered by a student cover all the course outcomes defined for that course. The percentage of students who achieve a set target (usually, 50% of the maximum marks,) calculated and that value decides the level of attainment of COs which correlated to that question.

Attainment Level 1: below 55% of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 2: 55% to 80 % of students score more than 50% marks out of the maximum relevant marks.

Attainment Level 3: more than 80% of students score more than 50% marks out of the maximum relevant marks.

At the end of the course, online feed backs are collected based on COs. Each CO is asked as question and that questionnaire has been send to Student. For example, if a course has six COs then six questions asked. The student may grade Excellent, Very Good, Good Satisfactory and Poor.

Feed back	CO Attainment	Level of attainment
Excellent	% CO attainment > 80	Level 1
Very Good	70 < % CO attainment < 80	Level 2
Good	60 < % CO attainment < 70	
Satisfactory	55 < % CO attainment < 60	
Poor	% CO attainment < 55	Level 3

Assessment Methods with weightage	**Level-1 (<55%)**	**Level-2 (55-80%)**	**Level-3 (>80%)**
Course Outcome Feedback (20%)	No. of students selected the option "**Poor**"	No. of students selected the option ""**Satisfactory** , **Very Good** or **Good**"	No. of students selected the option " **Excellent**"

Overall Course Outcome Attainment

The overall CO attainment level in the course considered is then computed as

Overall CO attainment level= 80% of (65% of CO attainment level in Internal tests +
35% of CO attainment level in University test) +
20% of CO attainment level in CO feed back

Overall CO attainment level = 1.74x0.8 + 2.24 x0.2= 1.84.

The above procedure of computing overall CO attainment is to be repeated for each course from first year to final year in an academic year (including opted electives, project work and technical seminars in final year) in order to enable computation of PO and PSO attainment levels.

Program Outcomes (POs) are one step broader statements than COs that describe what students are expected to know and be able to do upon the graduation. These relate to the skills, knowledge, and behavior that students acquire in their matriculation through the program.

Program outcomes and 'program specific outcomes' are attained through the attainment of COs. This is called direct attainment of POs and PSOs. The overall CO attainment value as computed in chapter 4 and the CO-PO mapping values as computed in chapter 3 are used to compute the attainment of POs.

CO Attainment:

CO Code	CO	Internal	University	Overall	Remarks
C413.1	2	1.75	2	1.98	**Level 2**
C413.2	1	1.50	2	1.79	**Level 6**
C413.3	2	1.75	2	1.91	**Level 1**
C413.4	1	1.25	2	1.66	**Level 3**

C4135	1	1.25	2	1.66	**Level 5**
C413.6	2.5	2.25	2	2.13	**Level 4**
Average	**2**	1.62	2	**1.87**	

CO – PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C413.1	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C413.2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C413.3	2	2	-	-	2	-	-	-	-	-	-	-	-	-
C413.4	2	2	-	-	2	-	-	-	-	-	-	-	-	2
C413.5	2	-	-	-	2	-	-	-	-	-	-	-	-	2
C413.6	2	-	-	-	2	-	-	-	-	-	-	-	-	-

PO – Attainment::

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C413	1.9	1.8			1.8									1.7
Target	2.16	2			2									2

Using above tables and the overall course attainment, the PO attainment values are computed.

Sample computation of PO values:

Internal attainment value = (Corresponding cell value from CO-PO mapping table Overall CO attainment value for CO) /3

5.5 PO attainment from Laboratories

The associated course outcomes are taken as governing course outcomes for the Laboratory courses. The PO attainment of any particular laboratory is nothing but the associated course PO attainment.

In case, of a particular lab is associated with more than one theory course, The average of those courses PO attainments will be treated as PO attainment of that particular Laboratory.

CO – PO Mapping:

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE														
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING														
Lab Course PO Attainment														
Year	III	Sem	I								AY	2020-21		
Course Name	ELECTRICAL MACHINES -II LABORATORY						Name of the Faculty	CHALADI SIVA GANGA BHAVANI						
Course Code	C316 (R1631026)													
CO-PO MAPPING:														
Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	2	2							2					
C316.2	2	2							2					
C316.3	2								2					
C316.4	2	2							2					
C316.5	2								2					
C316.6	2	2							2					
Average	2	2							2					

PO – Attainment::

PO ATTAINMENT :														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PO Attainment	2.1	2.1							2.1					
Target	2.00	2.00							2.00					

5.6 PO attainment from Projects

Each project will be mapped their project Title with All POs. Whatever the CO attainment they got from Internal and External viva Voce marks, placed in Project Title –Po mapping Table and that becomes Project attainment.

1. List of COs for Project Work:

Table 1. List of COs in project work.

CO	Course Outcome	PO	Attribute
C425.1.	Student can be able to identify and solve the issues related to electrical engineering by using engineering concepts. (Applying)	PO1	**ENGINEERING KNOWLEDGE**
C425.2.	Student should do the literature survey and recall the basics of the subjects in the area	PO2	**PROBLEM ANALYSIS**

	from recent journals and other sources. (Evaluating)		
C425.3.	Student can apply and simulate the result by using different software or possible extend that result as a prototype. (Applying)	PO9	**INDIVIDUAL AND TEAMWORK**
C425.4.	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work. (Applying)	PO3, PO5	**DESIGN/DEVELOPMENT OF SOLUTIONS, PO5 MODERN TOOL USAGE**
C425.5.	Compare the result of their work to improve the quality of work. (Evaluating)	PO4	**CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS**
C425.6.	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel. (Creating)	PO12	**LIFE-LONG LEARNING**

Table. COs-PO mapping for project work.

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
Department of Electrical and Electronics Engineering
CO - PO Mapping of Course

Class	IV B.TECH II-SEM EEE	AY	2021-22
Name of the Course	PROJECT	Name of the Faculty	CHALADI SIVA GANGA BHAVANI
Subject Code	R1642026		
NBA Code	C426		

CO-PO MAPPING:

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C426.1	3	2		1			1	2	3					
C424.2		3	2	3		2	1		3	2		2		
C424.3	2		2	2	2				3	2	2	2		2
C424.4							2	2	3	3	2	3		
C424.5					2				3	2	2	2		
C424.6					2				3	2	2	2		
Average	2.16	2.5	2	2	2.2				2	2	2			2

Target CO Attainment	1.67644444

	PO Statement		PO Statement
PO1	Engineering Knowledge	PO8	Ethics
PO2	Problem Analysis	PO9	Indicvidual and Team work
PO3	Design/Develop solutions	PO10	Communication skills
PO4	Complex problem solving	PO11	Project Management & finance
PO5	Modern Tools usage	PO12	Lifelong learning
PO6	Engineer & Society	PSO1	Sustainable energy solutions: Design cutting edge technologies and provide solutions to overcome
PO7	Environment & Sustainability		the Global Energy crisis.
		PSO2	MATLAB, IoT Usage: Application of IOT, MATLAB in solving complex electrical engineering problems.
	Project Coordinator		ASSESSMENT COORDINATOR

Table Project CO-PO ATTAINMENTS for project work

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Assessment

Course Name:	**PROJECT**	Academic Year:	2021-22
Faculty Name:	CHALADI SIVA GANGA BHAVANI	Year & Semester:	IV Year II Semester
Course Code:	R1642026	Branch & section:	EEE- A&B

S.No	ROLL NO	1st Review	2nd Review	3rd Review	Internal	End Semester grade	Grade Points
Maximum Marks		**20**	**20**	**20**	**60**	**O**	10
1	18H41A0201	17	17	18	**52**	S	9
2	18H41A0202	19	19	20	**58**	O	10
3	18H41A0203	17	18	19	**54**	O	10
4	18H41A0204	20	20	20	**60**	O	10
5	18H41A0206	18	18	19	**55**	S	9
6	18H41A0207	18	19	19	**56**	S	9
7	18H41A0208	19	19	20	**58**	S	9
8	18H41A0209	20	20	20	**60**	O	10
9	18H41A0210	20	20	20	**60**	O	10
10	18H41A0211	18	19	19	**56**	O	10
11	18H41A0212	20	20	20	**60**	O	10
12	18H41A0213	20	20	20	**60**	O	10
13	18H41A0215	16	17	17	**50**	S	9
14	18H41A0216	16	18	18	**52**	S	9
15	18H41A0217	16	17	17	**50**	S	9
16	18H41A0218	15	15	15	**45**	S	9
17	18H41A0220	18	19	19	**56**	O	10
18	18H41A0223	19	19	20	**58**	O	10
19	18H41A0224	19	19	20	**58**	O	10
20	18H41A0225	19	19	20	**58**	O	10
21	18H41A0226	15	15	16	**46**	S	9
22	18H41A0228	17	18	19	**54**	S	9

23	18H41A0229	18	19	19	**56**	S	9
24	18H41A0230	16	17	17	**50**	S	9
25	18H41A0231	18	19	19	**56**	S	9
26	18H41A0232	16	17	17	**50**	S	9
27	18H41A0233	16	17	17	**50**	S	9
28	18H41A0234	20	20	20	**60**	O	10
29	18H41A0235	18	19	19	**56**	S	9
30	18H41A0236	18	19	19	**56**	O	10
31	18H41A0237	16	16	16	**48**	S	9
32	18H41A0238	20	20	20	**60**	O	10
33	18H41A0239	18	19	19	**56**	O	10
34	18H41A0240	20	20	20	**60**	O	10
35	18H41A0241	16	17	17	**50**	S	9
36	18H41A0242	15	15	16	**46**	S	9
37	18H41A0243	20	20	20	**60**	O	10
38	18H41A0244	15	15	16	**46**	S	9
39	18H41A0245	18	18	18	**54**	S	9
40	18H41A0246	16	17	17	**50**	S	9
41	18H41A0247	16	17	17	**50**	S	9
42	18H41A0248	20	20	20	**60**	O	10
43	18H41A0249	16	16	16	**48**	S	9
44	18H41A0250	20	19	19	**58**	O	10
45	18H41A0251	17	18	19	**54**	S	9
46	18H41A0252	20	20	20	**60**	O	10
47	18H41A0253	20	19	19	**58**	O	10
48	18H41A0254	20	19	19	**58**	S	9
49	18H41A0255	16	18	18	**52**	S	9
50	19H45A0201	17	18	19	**54**	S	9
51	19H45A0202	20	20	20	**60**	O	10
52	19H45A0203	17	17	18	**52**	S	9
53	19H45A0204	20	19	19	**58**	O	10
54	19H45A0205	20	19	19	**58**	O	10
55	19H45A0206	20	20	20	**60**	O	10
56	19H45A0207	20	19	19	**58**	S	9
57	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

56	19H45A0207	20	19	19	**58**	S	9
57	19H45A0208	20	19	19	**58**	O	10
58	19H45A0209	20	19	19	**58**	O	10
59	19H45A0210	18	19	19	**56**	O	10
60	19H45A0211	20	20	20	**60**	O	10
61	19H45A0212	18	19	19	**56**	S	9
62	19H45A0213	20	20	20	**60**	O	10
63	19H45A0214	17	17	18	**52**	S	9
64	19H45A0216	16	16	16	**48**	S	9
65	19H45A0217	20	19	19	**58**	O	10
66	19H45A0219	20	19	19	**58**	O	10
67	19H45A0220	17	18	19	**54**	S	9
68	19H45A0221	20	20	20	**60**	O	10
69	19H45A0222	20	19	19	**58**	O	10
70	19H45A0223				**0**		
71	19H45A0224	16	17	17	**50**	S	9
72	19H45A0225	20	20	20	**60**	O	10
73	19H45A0227	17	18	19	**54**	S	9
74	19H45A0228	20	20	20	**60**	O	10
75	19H45A0229	20	19	19	**58**	S	9
76	19H45A0230	17	18	19	**54**	S	9
77	19H45A0231	17	18	19	**54**	S	9
78	19H45A0232	20	20	20	**60**	O	10
Class Average Mark		18	18	19	55	O	9
Student Scored above		36	46	55	47	77	38
Students attempted the questi		77	77	77	78	77	77
% students scored above		47	60	71	60	100	49
Attainment level		2	2	3	2	3	2

					Internal	University Exam	Over all
C426.1	2			2	2	2	2.00
C426.2	2			2	2	2	2.00
C426.3		2		2	2	2	2.00
C426.4		2		2	2	2	2.00
C426.5			3	2	2.5	2	2.15
C426.6			3	2	2.5	2	2.15
						Overall Course attainment	2.05
						Set target for course attainment	1.67
						Status of the course attainment (Yes/No)	Yes

C426.1	Applying	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts.
C426.2	Evaluating	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources
C426.3	Applying	Student can apply and simulate the result by using different softwares or possible extend that result as a prototype
C426.4	Applying	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.
C426.5	Evaluating	Compare the result of their work to improve the quality of work
C426.6	Creating	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel.

Base Target taken for CO: Class average Mark

Rubrics:

>65% students	3		
50 to 65% students	2	Best performing Course Outcome:	C426.5, C426.6
<45 % students	1	Least performing Course Outcome:	C426.1, C426.2, C426.3 AND C426.4

Reason for low attainment:	1	
	2	
	3	
Plan of Action for improvement		
	1	Students have to improve thir practical knowledge
	2	
	3	

Faculty Signature

The overall Attainment is: 2.0

Direct assessment Methods		
Sl.no	**Direct Assessment**	**Method Description**
1.	**Internal Assessment Test**	The Internal Assessment marks in a theory paper shall be based on two tests generally conducted at the end of 8 and 16 weeks of each semester. It is a metric to continuously assess the attainment of course outcomes w.r.t course outcomes. **R13 curriculum**: The best marks obtained from the two tests shall be the Internal Assessment Marks for the relevant subject.

		R16 curriculum: 20% weightage to least marks obtained from the two tests and 80% weightage to best marks obtained from the two tests shall be the Internal Assessment Marks for the relevant subject.
2.	**Lab Assignments**	Lab Assignment can be one of the measuring criteria to mainly assess student's practical knowledge with their designing capabilities. In case of Practical, the IA marks shall be based on the Day-to-day evaluation, practical record marks, attendance and one practical test.
3.	**Theory Semester Examination**	University conducts external theory and practical exam once in a semester. Semester examination (theory or practical) are the metric to assess whether all the course outcomes are attained or not framed by the course owner. Semester Examination is more focused on attainment of course outcomes and uses a descriptive exam.
4.	**Practical Semester Examination**	
5.	**Project**	The Internal marks in the case of projects in the final year shall be based on the evaluation by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the project / seminar guide. Three reviews are conducted by Committee for 60 marks and summation of all review marks becomes internal marks of the Student.
6.	**Project Work Viva-voce**	Viva-voce examination of project work shall be conducted batch-wise. University conducts external viva voce for 140marks.

5.7 PO attainment from co-curricular and extra-curricular activities

5.8 PO attainment from stakeholder feedbacks

Indirect methods such as surveys and feedbacks taken from the stakeholders to identify the student learning. They assess opinions or thoughts about the graduate's knowledge or skills and their values by different stakeholders. For determining indirect attainment of POs and PSOs, student exit feedback, employer feedback, and Alumni feedback was considered (which includes attainments from both curricular &co/ extracurricular activities).

S.NO	Activity	Poor (1)	Satisfactory	Good (3)
1	Guest Lecturers, Workshops& Seminars(Co-Curricular)	Program Organizes 1-2 Guest Lecturers	Program Organizes 3-4Lecturers	Program Organizes 5 or more Guest Lecturers
2	Add-on Courses(Co-Curricular)	Program organized 1 Add on Program	Program organized 2 Addon Program	Program organized 3 or More Add on Program
3	Projects Exhibition (Co-Curricular)	No Project Exhibitions	Every Year	Every Semester
4	Paper Presentations (Co-Curricular)	Nil	Every Year	Every Semester
5	NSS Activities (Extra-Curricular)	Less than 25% Program Students Participate	26-50% Students Participate	Above 50% Students Participate
6	Program on Environment Sustainability Organized (Co-Curricular)	Nil	1-2 Programs	More Programs
7	Programs on Ethics (Co-Curricular)	Nil	1-2 Programs	More Programs
8	Ethical Practices - Like Honesty Shops Yoga etc (Extra-Curricular)	Nil	1-2 Practices	More Practices
9	Library, Internet Hours (Co-Curricular)	Nil	Lib or Internet	Both
10	Students Seminar & English Communication Hours (Co-Curricular)	Nil	Either	Both
11	Entrepreneurship - Lecturers (Co-Curricular)	Nil	1-2 Lecturers	More Lecturers
12	Students Qualification in English Communication Certification (Co-Curricular)	Nil	25-50% Students	Above 50% Students
13	Programs on Health or Course on Human Anatomy	Nil	1-2 Programs	More Programs
14	Programs on Safety Engineering	Nil	1-2 Programs	More Programs
15	Students Participation in Cultural Events, Activities	10-25%	26-50%	51% & above
16	Industry Internship	Less than 10 students participated	10-15 students participated	15 or above students participated
17	Industry visits/tours	Less than 10 students participated	10-15 students participated	15 or above students participated

Indirect assessment Methods		
S. No	**Indirect Assessment Method**	**Method Description**
1.	**Alumni Feedback**	Collect variety of information about program Satisfaction and college from the alumni students.
2.	**Exit Student Feedback**	Collected when the student completes his/her degree and leaving the institution
3.	**Employer feedback**	Collect variety of information about the graduates' skills, capabilities and opportunities (during the placement drives, also from the employers where the graduates are contributing)

Sample Alumni Survey Feedback

ALUMNISURVEY

DepartmentofElectrical and ElectronicsEngineering,
BVC INSTITUTE OF TECHNOLOGY & SCIENCE,
Amalapuram,
Andhra
Pradesh,www.bvcits.edu.
in

Name: M.Sriram		Roll No: 16H41A0225	
Branch: E.E.E		Year of Completion: 2020	
Mailing Address: Srirammamidipalli225@gmail.com			
City: Hyderabad	State: Andhra Pradesh	Pin Code: 533274	
Phone No: 9100641911		Email: srirammamidipalli225@gmail.com	
Company: Infosys		Designation: Associate Software Engineer	

ALUMNI SURVEY QUESTIONNAIRE

Evaluate your rating for each of the indicators in the following data

Good	Average	Poor
3	2	1

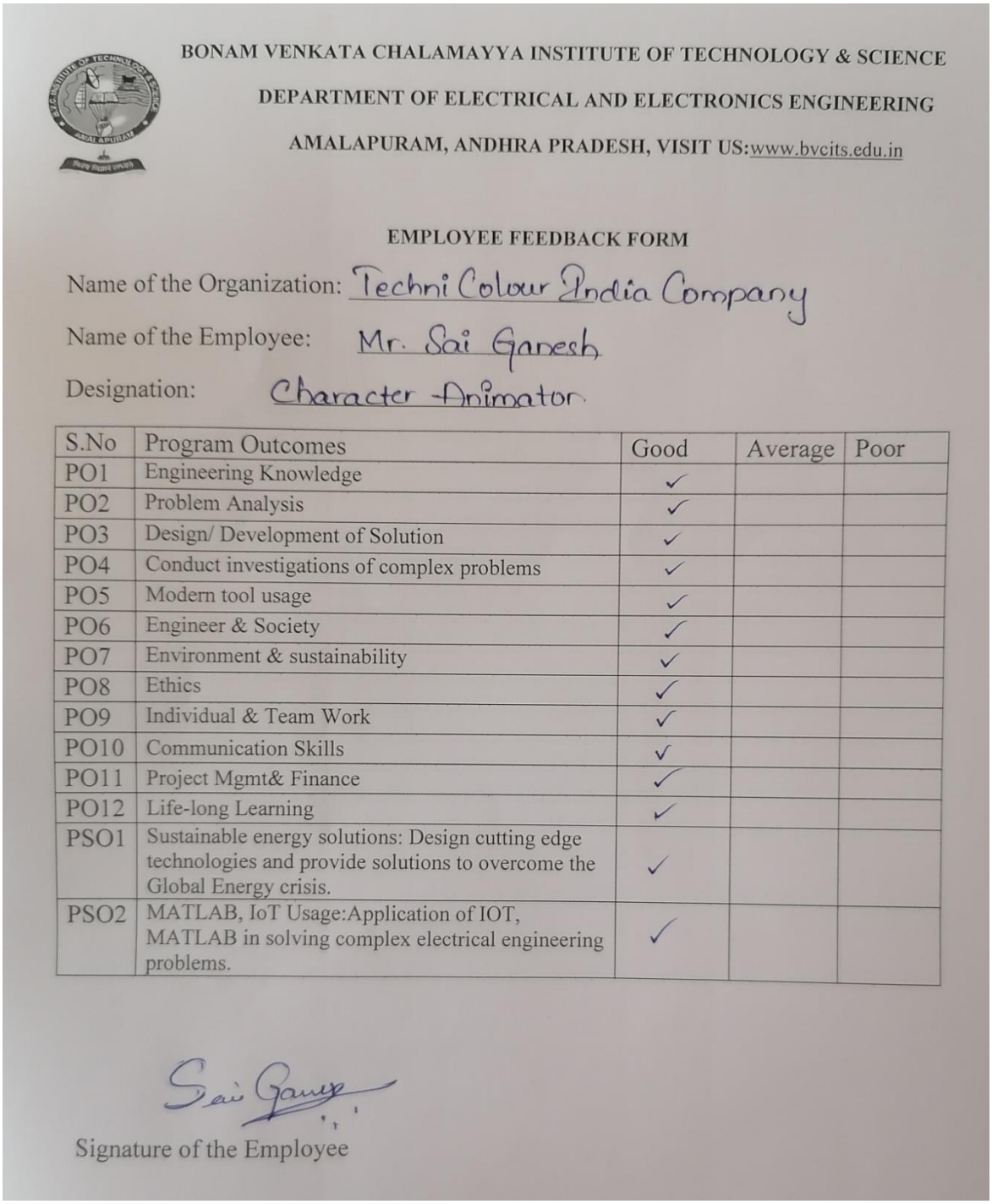
1. Indicate how well do you agree with each Program Outcomes POs (refer Annexure)as a predictedaccomplishmentforthisprogramme.

Program Outcomes (PO)	3	2	1
PO1.Engineeringknowledge.	✓		
PO2.Problemanalysis	✓		
PO3.Design/development ofsolutions		✓	
PO4.Conductinvestigationsofcomplex problems		✓	
PO5.Modern tool usage	✓		
PO6.Theengineerand society	✓		
PO7.Environment and sustainability	✓		
PO8.Ethics	✓		
PO9.Individualandteamwork	✓		
PO10.Communication	✓		
PO11.Project managementandfinance		✓	
PO12.Life-longlearning	✓		

2. Indicate how well do you agree with each Program Specific Outcomes PSOs (refer Annexure E)as apredictedaccomplishmentfor thisprogramme.

ProgramSpecific Outcomes(PSO)	3	2	1
PSO 1. Sustainable energy solutions: Design cutting edge technologies and provide solutions to overcome the Global Energy crisis.	✓		
PSO 2. MATLAB, IoT Usage: Application of IOT, MATLAB in solving complex electrical engineering problems	✓		

Sample Employee Feedback*:*



BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

AMALAPURAM, ANDHRA PRADESH, VISIT US:www.bvcits.edu.in

EMPLOYEE FEEDBACK FORM

Name of the Organization: Techni Colour India Company

Name of the Employee: Mr. Sai Ganesh

Designation: Character Animator

S.No	Program Outcomes	Good	Average	Poor
PO1	Engineering Knowledge	✓		
PO2	Problem Analysis	✓		
PO3	Design/ Development of Solution	✓		
PO4	Conduct investigations of complex problems	✓		
PO5	Modern tool usage	✓		
PO6	Engineer & Society	✓		
PO7	Environment & sustainability	✓		
PO8	Ethics	✓		
PO9	Individual & Team Work	✓		
PO10	Communication Skills	✓		
PO11	Project Mgmt& Finance	✓		
PO12	Life-long Learning	✓		
PSO1	Sustainable energy solutions: Design cutting edge technologies and provide solutions to overcome the Global Energy crisis.	✓		
PSO2	MATLAB, IoT Usage:Application of IOT, MATLAB in solving complex electrical engineering problems.	✓		

Sai Ganesh

Signature of the Employee

Sample EXIT Survey Feedback:

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
EXIT FEEDBACK

		POOR	1	MEDIUM	2	HIGH	3							
Regd. No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
18H41A0201	2	3	1	2	2	2	2	2	3	1	2	2	2	2
18H41A0202	2	3	2	3	2	3	2	2	2	2	3	2	3	1
18H41A0203	3	3	2	1	1	2	3	3	3	2	1	1	2	3
18H41A0204	2	2	2	2	2	3	2	2	2	2	2	2	3	2
18H41A0206	3	1	1	3	1	2	3	3	1	1	3	1	2	2
18H41A0207	3	2	3	2	2	3	3	3	2	3	2	2	2	3
18H41A0208	3	3	2	1	3	2	3	3	3	2	1	3	2	2
18H41A0209	2	2	1	3	2	3	2	2	2	1	3	2	2	1
18H41A0210	2	2	3	2	1	2	2	2	2	3	2	1	2	2
18H41A0211	2	1	2	2	2	3	2	2	1	2	2	2	2	3
18H41A0212	3	3	2	2	3	2	3	3	1	2	2	3	2	2
18H41A0213	2	3	3	2	2	3	2	2	2	3	2	2	2	3
18H41A0215	2	3	3	2	3	3	2	2	3	3	2	3	2	2
18H41A0216	1	3	2	2	2	2	1	1	2	2	2	2	1	3
18H41A0217	2	2	1	1	3	2	2	2	2	1	1	3	1	2
18H41A0218	1	2	3	1	2	2	1	1	2	3	1	2	1	3
18H41A0220	2	3	2	1	3	2	2	2	3	2	1	3	2	2
18H41A0223	1	2	1	2	2	1	1	1	2	1	2	2	2	3
18H41A0224	1	3	3	2	3	2	1	1	3	3	2	3	2	2
18H41A0225	2	2	2	2	2	1	2	2	2	2	2	2	1	3
18H41A0226	2	3	1	1	3	2	2	2	3	1	1	3	3	2
18H41A0228	2	2	3	3	2	1	2	2	2	3	3	2	2	3
18H41A0229	1	3	2	2	3	2	1	1	3	2	2	3	1	2
18H41A0230	3	2	2	1	2	1	3	3	2	2	1	2	3	3
18H41A0231	3	2	3	3	3	2	3	3	2	3	3	3	2	2
18H41A0232	3	2	2	2	2	1	3	3	2	2	2	2	1	2
18H41A0233	3	2	1	1	2	2	3	3	2	1	1	2	3	2
18H41A0234	2	3	2	3	2	2	2	2	2	2	3	2	2	2
18H41A0235	3	3	3	2	2	3	3	3	2	3	2	2	1	1
18H41A0236	3	2	2	1	1	3	3	3	2	2	1	1	3	1
18H41A0237	3	2	1	3	1	3	3	3	2	1	3	1	2	1
18H41A0238	2	2	2	2	1	3	2	2	2	2	2	1	3	1
18H41A0239	2	3	3	3	1	2	2	2	2	3	3	1	2	1
18H41A0240	3	2	2	2	1	3	2	2	2	2	2	1	3	2
18H41A0241	3	2	1	3	2	2	2	2	2	1	3	2	2	3
18H41A0242	3	1	3	2	3	3	2	2	1	3	2	3	3	2
18H41A0243	3	2	2	3	2	2	3	3	2	2	3	2	3	3
18H41A0244	3	2	3	3	3	2	2	2	2	3	3	3	2	2
18H41A0245	3	3	3	2	2	2	3	3	3	3	2	2	3	3
18H41A0246	3	3	2	3	3	3	2	2	3	2	3	3	3	2
18H41A0247	3	2	3	3	2	2	3	3	2	3	3	2	2	3
18H41A0248	3	3	1	2	3	3	2	2	3	1	2	3	3	2
18H41A0249	2	2	3	3	2	2	2	2	2	3	3	2	2	2
18H41A0250	2	3	2	2	2	3	2	2	3	2	2	2	3	2
18H41A0251	1	2	1	3	2	2	1	1	2	1	3	2	2	1
18H41A0252	1	3	3	2	1	2	1	1	3	3	2	1	3	2
18H41A0253	1	2	1	3	2	1	1	1	2	2	3	2	3	1
18H41A0254	1	1	1	3	1	2	1	1	3	1	3	1	2	2
18H41A0255	3	2	1	1	2	2	3	3	2	1	2	2	3	2
19H45A0201	3	3	3	3	2	3	3	3	3	3	3	2	2	1
19H45A0202	1	2	3	2	1	3	3	3	2	3	2	1	2	2
19H45A0203	2	3	1	2	2	2	2	2	3	1	2	2	3	2
19H45A0204	2	1	2	3	2	3	2	2	2	2	3	2	1	1
19H45A0205	1	3	2	1	1	2	3	3	3	2	1	1	2	2
19H45A0206	2	2	2	1	2	3	2	2	2	2	2	2	3	1
19H45A0207	3	1	1	1	1	2	3	3	1	1	3	1	2	2
19H45A0208	1	2	3	2	2	3	3	3	2	3	2	2	1	3
19H45A0209	1	3	2	1	3	2	3	3	3	2	1	3	3	2
19H45A0210	2	2	3	3	2	3	2	2	2	1	3	2	2	1
19H45A0211	2	2	1	2	1	2	2	2	2	3	2	1	2	2
19H45A0212	2	1	2	2	2	3	2	2	1	2	2	2	2	3
19H45A0213	1	1	1	1	3	2	3	3	1	2	2	3	2	2
19H45A0214	1	1	3	2	2	3	2	2	2	3	2	2	2	3
19H45A0216	2	3	1	2	3	3	2	2	3	3	2	3	2	2
19H45A0217	1	2	2	2	2	2	1	1	2	2	2	2	1	3
19H45A0219	2	2	1	1	1	2	2	2	2	1	1	3	1	2
19H45A0220	1	2	3	1	2	2	1	1	2	3	1	2	1	3
19H45A0221	1	3	2	1	3	2	2	2	3	2	1	3	2	2
19H45A0222	1	2	1	2	2	1	1	1	2	1	2	2	2	3
19H45A0223	1	3	3	2	3	2	1	1	3	3	2	3	2	2
19H45A0224	1	2	2	2	2	1	2	2	2	2	2	2	1	3
19H45A0225	1	3	1	1	1	2	2	2	3	1	1	3	3	2
19H45A0227	1	1	3	3	2	1	2	2	2	3	3	2	2	3
19H45A0228	1	3	2	2	3	2	1	1	3	2	2	3	1	2
19H45A0229	1	2	2	1	1	1	3	3	2	2	1	2	3	3
19H45A0230	1	2	3	1	3	2	3	3	2	3	3	3	2	2

19H45A0231	1	2	2	2	2	1	3	3	2	2	2	2	1	2
19H45A0232	3	1	1	1	2	2	3	3	2	1	1	2	3	2
NUMBER OF STUDENTS		**78**												
PROGRAM OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
NUMBER OF STUDENT RELATED TO POOR	27	11	23	22	17	11	14	14	7	20	17	14	15	13
NUMBER OF STUDENT RELATED TO MEDIUM	55	58	45	56	66	64	60	60	80	52	61	68	62	65
NUMBER OF STUDENT RELATED TO HIGH	25	27	25	20	20	24	27	27	22	26	22	22	22	23
% OF ATTAINMENT	65.67	74.33	67.67	66.33	68.00	72.67	72.33	72.33	73.67	69.33	69.33	70.00	70.00	71.00
LEVEL OF ATTAINMENT	1.97	2.23	2.03	1.99	2.04	2.18	2.17	2.17	2.21	2.08	2.08	2.1	2.1	2.13

5.9Overall PO attainment

The evaluation POs is carried out with respect to student performance and surveys in both the terms of direct and indirect assessment methods. Direct method of assessment is based on assessment of PO on the achievements in the contributing courses for that particular PO. Indirect method of assessment is based on course exit survey, program exit survey, alumni survey, placement survey, feedback on facilities by students, parent's survey and rubrics developed for project and seminar.

5.10Continuous improvements

Pos	**Threshold Level**	**Attainment Level**	**Observation**
PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.			
PO1	**2.00**	**2.66**	Threshold Attained due to high contribution of Courses, Project, Seminar/Viva Voce etc.
Actions Initiated to Sustain/Improve PO Attainments: 1) Stimulating Laboratory Problems for students to practice in labs to reinforce basic concepts of engineering &science. 2) Additional Technical Skills Development Programs as Value-Addition to meet Industries Requirements. 3) Introduction of Contemporary topics as Topics beyond Syllabus to keep students' knowledge up to date. 4) Industry Internships to have knowledge on Industry Practices.			

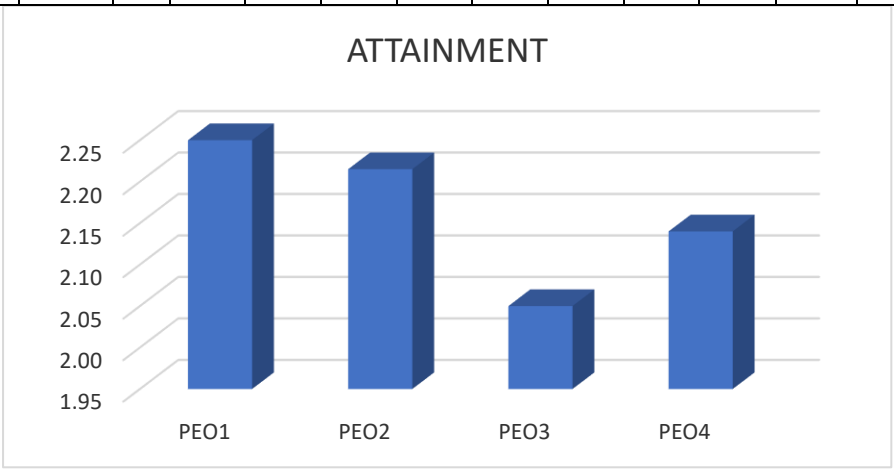
All Courses CO – PO Attainment:

PEO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PEO1	√	√	√	√	√	√			√		√		√	√
PEO2				√		√			√		√			
PEO3								√	√	√		√		
PEO4			√			√					√	√		

PEO-PO attainment

PEO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PEO1	3	3	3	3	3	2			2		2		3	3
PEO2				3		3			3		3			
PEO3								3	3	3		2		
PEO4			2			3					2	3		

PEO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	ATTAINMENT
PEO1	2.36	2.43	2.32	2.34	2.31	2.06			2.05		2.41		1.85	2.12	2.25
PEO2				2.34		2.06			2.05		2.41				2.22
PEO3								2	2.05	2.38		1.78			2.05
PEO4			2.32			2.06					2.41	1.78			2.14



PO ATTAINMENT 2018-22 BATCH

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C111	2.0				2.1		2.2		2.3	1.9		2.0		
C112	1.7	1.6	1.7	1.6										
C113	1.9	1.9	1.9	2.0	2.0	2.1	2.1							
C114	1.8	1.8											1.9	1.8
C115	2.1	2.0	2.0	2.0	2.0									
C116	1.4	1.4				1.5	1.5						1.4	
C117	2.4	2.6	2.5		2.5	2.6	2.4						2.4	
C118					1.8				1.7	1.8		1.8		
C119	1.8	2.0		2.0					1.9		1.9			
C121	1.6				1.5	1.5	1.5		1.5	1.6		1.8		
C122	1.7	1.7	1.7											
C123	1.8	1.8	1.8											
C124	2.0	2.0	2.0							2.0				2.0
C125	1.8	1.8	1.7		1.7									
C126	1.4			1.5						1.5			1.5	
C127					1.7				1.8	1.7		1.7		
C128	2.2	2.2			2.2								2.2	
C129	2.78	2.78	2.78		2.78									2.78
C1210	2.1	2.3	2.1	2.3	2.0				2.1		2.1			
C211	2.1	2.0		2.2	1.9								2.1	
C212	2.1	2.1	2.0										2.0	2.0
C213	1.8	1.8			1.9									
C214	2.1	2.1												
C215	2.3	2.3		2.3	2.3									
C216	2.08	2.03	2.03					1.87			2.1			
C217	1.6	1.6	1.5											
C218	1.7	1.7	1.7											
C221	1.9	1.9	1.9	2.0										
C222	1.9	1.9			1.9									

C223	2.6	2.6	2.5	2.5	2.3									
C224	1.8	1.8			1.8									1.8
C225	2.3	2.1												
C226		2.46					2.21	2.31	2.35		2.33		2.32	2.40
C227	2.1	2.1							2.1					
C228	2.5	2.5											2.5	
C311	2.1	2			2.1									
C312	1.9	1.9		2.1	1.9									
C313	1.9	2.0	1.9	1.9										
C314	1.9	1.9	1.9		1.9									1.9
C315	1.9	1.9	1.9		1.9							1.9	1.9	1.9
C316	2.1	2.1							2.1					
C317	2.3	2.3	2.4											2.3
C318	2.1	2.1							2.1					
C319			2.1			2.1								
C321	2.4	2.4	2.4		2.5	2.4							2.4	2.5
C322	2.1	2.1			2.2									2.2
C323	2.1	2.1	2.1	2.1	2.1		2.2						2.1	
C324	2.5	2.5	2.5	2.5										2.5
C3252	2.5	2.5	2.5	2.6	2.5	2.3			2.5	2.6	2.6	2.5		
C326	1.99	2.03	2.07						2.11				2.02	2.82
C327	2.0	1.9	1.9		1.9				2.0	2.2			2.0	
C328	1.9	1.9	1.8	1.9										1.9
C329								2.1		2.1				
C411	2.4	2.4		2.6	2.4									
C412	1.9	1.9	1.9	2.0									1.9	2.0
C413	1.9	1.8			1.8									1.7
C414	1.8	1.8	1.8	1.9										
C4154	2.0	2.0	2.0	2.1	2.1									
C4162	2.2	2.2		2.1	2.2									
C417	2.0	2.0	2.0						2.0					
C418	2.1	2.1			2.1				2.1				1.9	1.9

C421	2.40	2.42		2.38	2.32									
C422	2.3	2.3			2.3									
C423	2.4	2.4			2.2									
C4241	2.0		1.8		2.1									
C425	2.7	2.8	2.7		2.9				2.8	2.7			2.7	2.8
C426	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1		2.0
No of Courses Contributing to each PO-PSO Count	62	59	35	23	37	8	8	4	17	11	6	7	17	19
% of Courses Contributing to each PO-PSO	92.14	92.19	54.69	35.94	57.81	12.50	12.50	6.25	26.56	17.19	9.38	10.94	26.56	29.69
Sum	127.05	122.72	71.48	48.58	77.8	16.5	16.11	8.28	35.56	22.2	13.13	13.8	35.24	41.2
Direct Attainment through Courses	2.05	2.08	2.04	2.11	2.11	2.06	2.01	2.07	2.09	2.02	2.19	1.97	2.07	2.17

POs ATTAINMENT LEVEL

POs Attainment Levels 2018-22 Batch

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Direct Attainment	2.05	2.08	2.04	2.11	2.11	2.06	2.01	2.07	2.09	2.02	2.19	1.97	2.07	2.17
Indirect Attainment	2.17	2.4	2.09	2.07	1.99	2.25	2.22	2.22	2.21	2.11	1.98	2.13	2.16	2.08
Overall Attainment	2.07	2.14	2.04	2.22	2.07	2.24	2.11	2.22	1.92	2.12	2.14	2.07	2.13	2.26
Target	2.03	2.04	1.88	1.95	1.96	1.69	1.67	1.8	1.92	1.93	1.95	1.66	1.75	1.75

6. ANNEXURE

Internal and University Marks Evaluation Sheet

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Name:	POWER SYSTEM OPERATION & CONTROL	**Academic Year:**	2021 – 22
Faculty Name:	CHALADI S GANGA BHAVANI	**Year & Semester:**	IV Year I Semester
Course Code:	C413	**Branch & section:**	EEE-A&B

S.No	ROLL NO	Internal Examination-1									Internal Examination-2										Internal	End Semester grade	Grade Point
		1(A)	1(B)	2(A)	2(B)	3(A)	3(B)	Total	Assignment	Quiz	Total	1(A)	1(B)	2(A)	2(B)	3(A)	3(B)	Total	Assignment	Quiz	Total			
Maximum Marks		**5**		**5**		**5**		**15**	**5**	**10**	**30**	**5**		**5**		**3**	**2**	**15**	**5**	**10**	**30**	**30**	**O**	10
1	18H41A0201	3		4		5		**12**	5	1	**18**	5				3	2	**10**	5	2	**17**	18	D	5
2	18H41A0202	5		5		5		**15**	5	1	**21**	5		5		3	1	**14**	5	4	**23**	23	B	7
3	18H41A0203	3.5		4		3.5		**11**	5	2	**18**	5		5		3	1	**14**	5	5	**24**	23	B	7
4	18H41A0204	5		5		5		**15**	5	1	**21**	5		5		3	2	**15**	5	6	**26**	26	B	7
5	18H41A0206	3		2		4		**9**	5	3	**17**	5		2		3	1	**11**	5	5	**21**	21	C	6
6	18H41A0207	4		5				**9**	5	3	**17**	5				2	3	**10**	5	2	**17**	17	D	5
7	18H41A0208	5		4		4		**13**	5	4	**22**	3		5		3	2	**13**	5	2	**20**	12	D	5
8	18H41A0209	5		5		3		**13**	5	4	**22**	5		3		3	2	**13**	5	3	**21**	22	C	6
9	18H41A0210	5		5		4		**14**	5	6	**25**	4		4		3	2	**13**	5	6	**24**	25	B	7
10	18H41A0211	3		4		3		**10**	5	7	**22**	4		3		2	2	**11**	5	5	**21**	22	D	5
11	18H41A0212	4		5		5		**14**	5	3	**22**	5		4		3	2	**14**	5	6	**25**	25	B	7
12	18H41A0213	4		5		3.5		**13**	5	4	**22**	5		4		3	2	**14**	5	6	**25**	24	C	6
13	18H41A0214										**0**							**0**			**0**			FALSE
14	18H41A0215	4		4		3		**11**	5	2	**18**	3		3		3	2	**11**	5	5	**21**	21	D	5
15	18H41A0216	3		2		4		**9**	5	3	**17**	4		4		2	2	**12**	5	2	**19**	19	F	0
16	18H41A0217	3		2		3		**8**	5	4	**17**	3		3		3	2	**11**	5	4	**20**	20	F	0
17	18H41A0218	3		3		2		**8**	5	3	**16**	4		1		3	2	**10**	5	2	**17**	17	F	0
18	18H41A0220	4		4		4		**12**	5	3	**20**	5				3	2	**10**	5	3	**18**	20	F	0
19	18H41A0223	4.5		4.5		3		**12**	5	5	**22**	4		4		3	2	**13**	5	4	**22**	22	D	5
20	18H41A0224	5		5		4		**14**	5	5	**24**	4		4		3	2	**13**	5	5	**23**	24	C	6
21	18H41A0225	5		5		5		**15**	5	4	**24**	5		5		3	2	**15**	5	5	**25**	25	B	7
22	18H41A0226							**0**	5	4	**9**	3						**3**	5	0	**8**	9	F	0
23	18H41A0228	5		5		3		**13**	5	3	**21**	5		5		3	2	**15**	5	6	**26**	25	B	7
24	18H41A0229	5		5		5		**15**	4	5	**24**	5		5		3	2	**15**	5	4	**24**	24	C	6
25	18H41A0230	5		3.5		4.5		**13**	5	5	**23**							**0**	5	3	**8**	19	D	5
26	18H41A0231	3		4		1		**8**	5	5	**18**	5		5		3	2	**15**	5	4	**24**	23	C	6
27	18H41A0232	3		3				**6**	4	2	**12**	5						**5**	5	2	**12**	12	F	0
28	18H41A0233	5		5		3		**13**	5	4	**22**	5				3	2	**10**	5	4	**19**	22	C	6
29	18H41A0234	4		5		4		**13**	5	4	**22**	5		5		3	2	**15**	5	2	**22**	22	C	6
30	18H41A0235	2		3		1		**6**	4	4	**14**	5		5		3	2	**15**	5	4	**24**	22	C	6
31	18H41A0236	4.5		5		5		**15**	5	4	**24**	5		5		3	2	**15**	5	6	**26**	26	B	7
32	18H41A0237	3		3				**6**	5	3	**14**	5						**5**	5	0	**10**	14	F	0
33	18H41A0238	5		5		4		**14**	5	3	**22**	5		5		3	2	**15**	5	5	**25**	25	C	6
34	18H41A0239	5		5		5		**15**	5	5	**25**	5		5		3	2	**15**	5	5	**25**	25	B	7
35	18H41A0240	4.5		3.5		5		**13**	5	5	**23**	0				0	0	**0**	5	3	**8**	20	C	6
36	18H41A0241	0		3		3		**6**	5	3	**14**	4		3		3		**10**	5	2	**17**	17	F	0
37	18H41A0242	3		3				**6**	5	2	**13**	5						**5**	5	4	**14**	14	F	0
38	18H41A0243	5		5		5		**15**	5	6	**26**	5		5		3	2	**15**	5	5	**25**	26	A	8
39	18H41A0244	2		3				**5**	5	3	**13**	5		5		3	2	**15**	5	4	**24**	22	F	0
40	18H41A0245	5		5		5		**15**	5	2	**22**	5		5		3	2	**15**	5	5	**25**	25	A	8
41	18H41A0246	3		3				**6**	5	3	**14**	5		5		2		**12**	5		**17**	17	F	0
42	18H41A0247	4		3		3		**10**	5	2	**17**	3		3		3	2	**11**	5	2	**18**	18	D	5
43	18H41A0248	5		5		5		**15**	5	3	**23**	5		5		3	2	**15**	5	3	**23**	23	B	7
44	18H41A0249	0		0		0		**0**	5	3	**8**	3		3		3	2	**11**	5	2	**18**	16	F	0
45	18H41A0250	5		5		5		**15**	5	3	**23**	5		5		3	2	**15**	5	3	**23**	23	B	7
46	18H41A0251	4		4		2		**10**	5	4	**19**	5		5		3	2	**15**	5	3	**23**	23	B	7
47	18H41A0252	5		4		5		**14**	5	6	**25**	4		5		3	2	**14**	5	4	**23**	25	C	6
48	18H41A0253	5		5		5		**15**	5	3	**23**	4		5		3	2	**14**	5	4	**23**	23	B	7
49	18H41A0254	2		4		4		**10**	5	4	**19**	4		5		2	2	**13**	5	5	**23**	23	C	6
50	18H41A0255	5		5		5		**15**	5	3	**23**	2		5		3	2	**12**	5	4	**21**	23	C	6
51	19H45A0201			5		4		**9**	5	6	**20**	4		4		3	2	**13**	5	6	**24**	24	C	6
52	19H45A0202	5		5		5		**15**	5	5	**25**	4		4		3	1	**12**	5	3	**20**	24	B	7
53	19H45A0203								5	4	**9**	4		4		2	1	**11**	5	6	**22**	20	C	6
54	19H45A0204	5		5		0		**10**	5	4	**19**	5		5		2	1	**13**	5	0	**18**	19	B	7
55	19H45A0205	2		5		5		**12**	5	6	**23**	5		5		3	2	**15**	5	0	**20**	23	C	6
56	19H45A0206	5		4.5		4.5		**14**	5	4	**23**	5		4		3	2	**14**	5	2	**21**	23	B	7
57	19H45A0207	2.5		4		4		**11**	5	5	**21**	4		4		3	2	**13**	5	3	**21**	21	D	5
58	19H45A0208	5		5		5		**15**	5	6	**26**	4		5		2	2	**13**	5	4	**22**	26	C	6
59	19H45A0209	4		2.5		4		**11**	5	4	**20**	0		5		3	2	**10**	5	2	**17**	20	D	5
60	19H45A0210	4		4		3		**11**	5	5	**21**	5		5		2	2	**14**	5	4	**23**	23	C	6
61	19H45A0211	5		5		5		**15**	5	4	**24**	5		5		2	2	**14**	5	4	**23**	24	B	7
62	19H45A0212	2.5		5		2		**10**	5	2	**17**	4		5		2	2	**13**	5	3	**21**	21	D	5
63	19H45A0213	3		1		2		**6**	5	4	**15**	4		5		2	2	**13**	5	4	**22**	21	C	6
64	19H45A0214	3		2.5				**6**	5	5	**16**	4		4		2	2	**12**	5	5	**22**	21	F	0
65	19H45A0215							**0**			**0**							**0**			**0**			FALSE
66	19H45A0216	0.5		3				**4**	5	3	**12**	4		4			2	**10**	5	3	**18**	17	F	0
67	19H45A0217			4		4		**8**	5	4	**17**	4		5		2	2	**13**	5	3	**21**	21	B	7
68	19H45A0219	5				5		**10**	5	2	**17**	5		5		2	2	**14**	5	4	**23**	22	D	5
69	19H45A0220	3		4		3		**10**	5	3	**18**	5		3		2	2	**12**	5	6	**23**	22	C	6
70	19H45A0221	5		5		5		**15**	5	4	**24**	4		4		2	1	**11**	5	4	**20**	24	B	7
71	19H45A0222	5		4		4		**13**	5	4	**22**	4		4		2	2	**12**	5	5	**22**	22	A	8

72	19H45A0223						0	5	0	5	4		3		2	1	10	5	2	17	15	D	5
73	19H45A0224	3		4		2	9	5	4	18	3		4		2	1	10	5	4	19	19	F	0
74	19H45A0225	0		3		3	6	5	3	14	4		4		3	2	13	5	4	22	21	B	7
75	19H45A0227	0		3		3	6	5	4	15	3		3		3	2	11	5	3	19	19	D	5
76	19H45A0228	5		5		5	15	5	5	25	4		4		2	1	11	5	3	19	24	B	7
77	19H45A0229	3		3		4.5	11	5	5	21	4		4			2	10	5	2	17	22	F	0
78	19H45A0230	5		5		2	12	5	3	20	4		4		2	2	12	5	2	19	20	F	0
79	19H45A0231	4.5		4		2	11	5	4	20	4		4		2	1	11	5	2	18	20	D	5
80	19H45A0232	5		5		5	15	5	5	25	5		4		3	2	14	5	2	21	25	A	8
Class Average Mark		3.81		4.05		3.75	10.69	4.96	3.73	18.90	4.26		4.28		2.63	1.83	11.70	5.00	3.57	20.27	21.22		4.9
Student Scored above average mark		45		35		41	45	75	45	47	38		34		47	59	50	78	42	170	44	61	61
Students attempted the question		73		74		67	78	78	78	80	77		68		71	71	80	78	77	235	78	78	78
% students scored above average mark		61.6		47.3		61.2	57.69230769	96.15385	57.7	58.75	49.35		50.00		66.20	83.10	62.50	100.00	54.55	217	56.41	78.21	78.2051282
Attainment level		2		1		2	2	3	2	2	1		1		2	3	2	3	1	6	2	2	2

																			Internal	Univ. Exam	CO Attainment from Assessment	CO Attainment from Feedback	Overall Attainm
C413.1	2	0						3	2										1.75	2	1.8375	2.55	1.98
C413.2			1	0				3	2										1.50	2	1.68	2.24	1.75
C413.3					2	0		3	2										1.75	2	1.84	2.2	1.93
C413.4										1	0					3	1		1.25	2	1.51	2.25	1.66
C413.5												1	0			3	1		1.25	2	1.51	2.23	1.66
C413.6														2	3	3	1		2.25	2	2.16	1.99	2.13
																		Overall Course attainment					1.85
																		Set target for course attainment					1.6
																		Status of the course attainment (Yes/No)					YES

Course Outcomes

C413.1	Compute optimal scheduling of Generators.
C413.2	Elaborate hydrothermal scheduling
C413.3	Discuss the unit commitment Problem
C413.4	Distinguish the load frequency control for single area system with and without controllers
C413.5	Contrast the load frequency control for two area system with and without controllers
C413.6	Explore reactive power control in power systems and compensation of transmission lines

Base Target taken for CO: Class average Mark

Rubrics:

>80% students 3

80 to 55% student 2

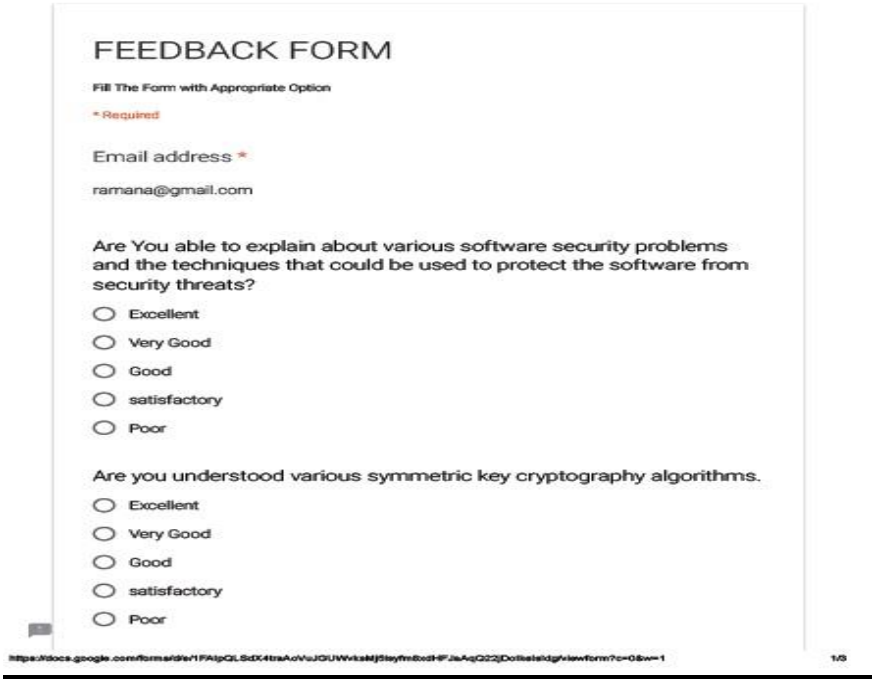
<55 % students 1

Best performing Course Outcome:	C411.6
Least performing Course Outcome:	C411.1

Reason for low attainment:

Plan of Action for improvement: Students have to practice more numerical problems

Course Learning Outcome Feedback Sheet



FEEDBACK FORM

Fill The Form with Appropriate Option

* Required

Email address *

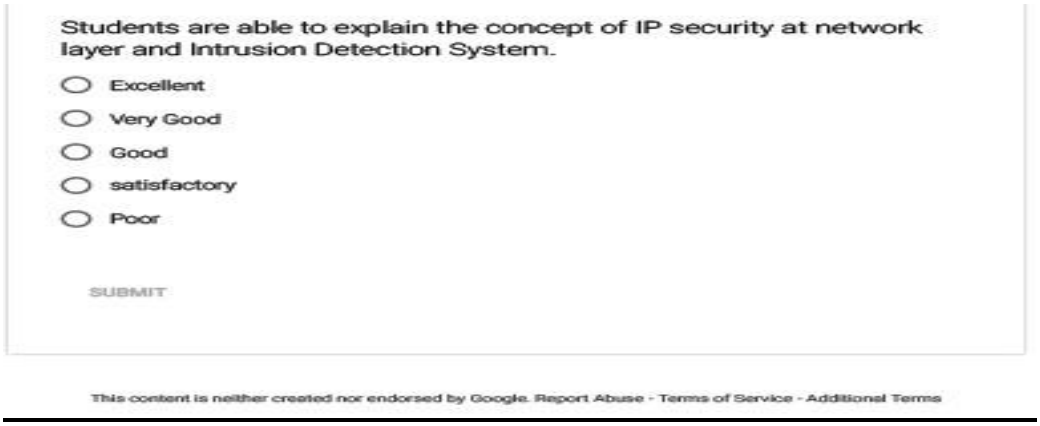
ramana@gmail.com

Are You able to explain about various software security problems and the techniques that could be used to protect the software from security threats?

- Excellent
- Very Good
- Good
- satisfactory
- Poor

Are you understood various symmetric key cryptography algorithms.

- Excellent
- Very Good
- Good
- satisfactory
- Poor



Students are able to explain the concept of IP security at network layer and Intrusion Detection System.

- Excellent
- Very Good
- Good
- satisfactory
- Poor

SUBMIT

Feedback Analysis Sheet

LAB evaluation Sheet

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

LAB COURSE ASSESSMENT

Lab Course Name:	ELECTRICAL MACHINES -II LABORATORY	Academic Year:	2020-21
Faculty Name:	CHALADI SIVA GANGA BHAVANI	Year & Semester:	III-1
Course Code:	C316 (R1631026)	Branch & section:	EEE-A&B

		Experiment Wise Assessment																		
S. No	ROLL NO	1	2	3	4	5	6	7	8	9	10	11	12	Lab Internal Exam	Day to day	Record	Observation	Total	End Semester grade	Grade Point
	Maximum Marks	10	10	10	10	10	10	10	10	10	10	10	10	10	5	5	5	25	O	10
1	18H41A0201			8										8	2	3	3	16	C	6
2	18H41A0202					9								9	5	4	4	22	O	10
3	18H41A0203						10							9	5	4	5	23	O	10
4	18H41A0204								10					10	5	5	5	25	O	10
5	18H41A0205																	0		
6	18H41A0206		5											5	3	3	3	14	B	7
7	18H41A0207				9									9	4	3	4	20	B	7
8	18H41A0208									9				9	5	4	4	22	S	9
9	18H41A0209							9						9	5	5	5	24	S	9
10	18H41A0210										9			9	5	5	5	24	O	10
11	18H41A0211												9	9	3	3	4	19	A	8
12	18H41A0212											9		9	5	5	5	24	O	10
13	18H41A0213		9											9	5	5	5	24	O	10
14	18H41A0214					3								3	2	2	1	8		FALSE
15	18H41A0215				9									9	4	5	4	22	S	9
16	18H41A0216						9							9	4	4	4	21	A	8
17	18H41A0217										9			9	5	5	4	23	S	9
18	18H41A0218								9					9	5	5	4	23	S	9
19	18H41A0219																	0		
20	18H41A0220											9		9	4	5	4	22	O	10
21	18H41A0223							10						10	5	5	5	25	O	10
22	18H41A0224			10										10	5	5	5	25	O	10
23	18H41A0225	10												10	5	5	5	25	O	10
24	18H41A0226												7	7	4	3	3	17	B	7
25	18H41A0227																	0		FALSE
26	18H41A0228	9												9	5	5	4	23	O	10
27	18H41A0229		9											9	4	5	4	22	S	9
28	18H41A0230					9								9	3	3	4	19	A	8
29	18H41A0231				9									9	5	4	5	23	O	10

29	18H41A0231				9								9	5	4	5	23	O	10
30	18H41A0232								9				5	2	2	3	12	ABSENT	ABSENT
31	18H41A0233							9					9	5	4	5	23	S	9
32	18H41A0234										9		9	5	4	5	23	O	10
33	18H41A0235											9	9	5	5	5	24	O	10
34	18H41A0236									9			9	5	5	5	24	O	10
35	18H41A0237						9						5	3	1	2	11	ABSENT	ABSENT
36	18H41A0238					9							9	5	5	5	24	O	10
37	18H41A0239					9							9	5	5	5	24	O	10
38	18H41A0240								10				9	5	4	5	23	O	10
39	18H41A0241										6		6	4	4	4	18	A	8
40	18H41A0242											5	5	2	2	3	12	ABSENT	ABSENT
41	18H41A0243									10			10	5	5	5	25	O	10
42	18H41A0244							5					5	4	3	4	16	F	0
43	18H41A0245					9							9	5	5	5	24	O	10
44	18H41A0246			5									5	2	2	2	11	ABSENT	ABSENT
45	18H41A0247	6											6	3	4	4	17	A	8
46	18H41A0248		9										9	5	5	5	24	O	10
47	18H41A0249				3								3	2	2	3	10	ABSENT	ABSENT
48	18H41A0250						10						10	5	5	5	25	O	10
49	18H41A0251		10										10	5	5	5	25	O	10
50	18H41A0252				10								10	5	5	5	25	O	10
51	18H41A0253					10							10	5	5	5	25	O	10
52	18H41A0254						9						9	5	5	5	24	S	9
53	18H41A0255							9					9	5	4	5	23	O	10
54	19H45A0201							9					9	5	4	5	23	O	10
55	19H45A0202								10				10	5	5	5	25	O	10
56	19H45A0203			9									9	5	4	5	23	O	10
57	19H45A0204	9											9	5	4	5	23	O	10
58	19H45A0205									9			9	5	5	5	24	O	10
59	19H45A0206										9		9	5	5	5	24	O	10
60	19H45A0207											9	9	5	5	5	24	O	10
61	19H45A0208		10										10	5	5	5	25	O	10
62	19H45A0209				8								8	4	4	4	20	S	9
63	19H45A0210						9						9	5	4	5	23	O	10
64	19H45A0211							9					9	5	4	5	23	O	10
65	19H45A0212							9					9	5	5	4	23	O	10
66	19H45A0213										10		10	5	5	5	25	O	10
67	19H45A0214											9	9	5	4	4	22	S	9
68	19H45A0215									3			3	2	1	2	8	ABSENT	ABSENT
69	19H45A0216								6				6	3	3	3	15	ABSENT	ABSENT
70	19H45A0217				9								9	5	5	5	24	O	10
71	19H45A0219					9							9	4	4	5	22	O	10
72	19H45A0220			10									10	5	5	5	25	O	10
73	19H45A0221	9											9	5	5	5	24	O	10
74	19H45A0222		10										10	5	5	5	25	O	10
75	19H45A0223	9											9	5	5	5	24	O	10
76	19H45A0224				7								7	4	3	4	18	A	8
77	19H45A0225						10						10	5	5	5	25	O	10
78	19H45A0227					9							9	5	5	4	23	S	9
79	19H45A0228							10					10	5	5	5	25	O	10
80	19H45A0229								9				9	5	5	5	24	O	10
81	19H45A0230							9					9	4	4	4	21	A	8
82	19H45A0231									9			9	5	5	4	23	O	10
83	19H45A0232										10		10	5	5	5	25	O	10
Class Average Mark		8.7	8.9	8.4	8.0	8.3	9.3	9.4	8.6	8.8	8.3	8.9	8.0	8.5	4.4	4.2	4.4	20.8		9.3
Student Scored above average mark		5	6	3	6	6	2	3	7	5	6	6	4	64	55	44	47	61		49
Students Done the Experiment		6	7	5	8	7	6	7	8	6	7	7	6	80	80	80	80	83		72
% students scored above average mark		83	86	60	75	86	33	43	88	83	86	86	67	80	69	55	59	73		68
Attainment level		3	3	2	2	3	1	1	3	3	3	3	2	3	2	1	1	2		2

																Internal	Univ. Exam	Overall	CO Attainment from Feedback	Overall CO Attainmen
C316.1	3											3	2	1	1	2.25	2.00	2.16	2.23	2.18
C316.2		3	2	2		1				3			2	1	1	2.00	2.00	2.00	2.23	2.05
C316.3					3								2	1	1	2.00	2.00	2.00	2.23	2.05
C316.4								3	3				2	1	1	2.25	2.00	2.16	2.23	2.18
C316.5										3			2	1	1	2.00	2.00	2.00	2.23	2.05
C316.6							1					2	2	1	1	1.50	2.00	1.68	2.23	1.79
																Overall Course attainment				2.05
																Set target for course attainment				1.60
																Status of the course attainment (Yes/No)				Yes

LAB COURSE OUTCOMES	
C316.1	Obtain the performance of three phase induction motor by conducting brake test
C316.2	Compute the Equivalent Circuit paramerters of three phase & single phase Induction Motors
C316.3	Obtain the control of speed of three phase induction motor.
C316.4	Predetermine the regulation of three–phase alternator by various methods.
C316.5	Determine the Xd/ Xq ratio of alternator and asses the performance of three–phase synchronous motor
C316.6	Evaluate the power factor improvement of single phase induction motor

Base Target taken for CO:		Class average Mark
Rubrics:		
>80% students	3	
80 to 60% students	2	
60 % students	1	

Reason for low attainment:		
	1	
	2	
	3	

Plan of Action for improvement		
	1	Students have to the parameters properly
	2	
	3	

Project evaluation Sheet

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Assessment

Course Name:	PROJECT	Academic Year:	2021-22
Faculty Name:	CHALADI SIVA GANGA BHAVAN	Year & Semester:	IV Year II Semester
Course Code:	R1642026	Branch & section:	EEE- A&B

S.No	ROLL NO	1st Review	2nd Review	3rd Review	Internal	End Semester grade	Grade Points
Maximum Marks		**20**	**20**	**20**	**60**	**O**	10
1	18H41A0201	17	17	18	**52**	S	9
2	18H41A0202	19	19	20	**58**	O	10
3	18H41A0203	17	18	19	**54**	O	10
4	18H41A0204	20	20	20	**60**	O	10
5	18H41A0206	18	18	19	**55**	S	9
6	18H41A0207	18	19	19	**56**	S	9
7	18H41A0208	19	19	20	**58**	S	9
8	18H41A0209	20	20	20	**60**	O	10
9	18H41A0210	20	20	20	**60**	O	10
10	18H41A0211	18	19	19	**56**	O	10
11	18H41A0212	20	20	20	**60**	O	10
12	18H41A0213	20	20	20	**60**	O	10
13	18H41A0215	16	17	17	**50**	S	9
14	18H41A0216	16	18	18	**52**	S	9
15	18H41A0217	16	17	17	**50**	S	9
16	18H41A0218	15	15	15	**45**	S	9
17	18H41A0220	18	19	19	**56**	O	10
18	18H41A0223	19	19	20	**58**	O	10
19	18H41A0224	19	19	20	**58**	O	10
20	18H41A0225	19	19	20	**58**	O	10
21	18H41A0226	15	15	16	**46**	S	9
22	18H41A0228	17	18	19	**54**	S	9
23	18H41A0229	18	19	19	**56**	S	9
24	18H41A0230	16	17	17	**50**	S	9
25	18H41A0231	18	19	19	**56**	S	9
26	18H41A0232	16	17	17	**50**	S	9
27	18H41A0233	16	17	17	**50**	S	9
28	18H41A0234	20	20	20	**60**	O	10
29	18H41A0235	18	19	19	**56**	S	9
30	18H41A0236	18	19	19	**56**	O	10
31	18H41A0237	16	16	16	**48**	S	9
32	18H41A0238	20	20	20	**60**	O	10
33	18H41A0239	18	19	19	**56**	O	10
34	18H41A0240	20	20	20	**60**	O	10
35	18H41A0241	16	17	17	**50**	S	9

35	18H41A0241	16	17	17	**50**	S	9
36	18H41A0242	15	15	16	**46**	S	9
37	18H41A0243	20	20	20	**60**	O	10
38	18H41A0244	15	15	16	**46**	S	9
39	18H41A0245	18	18	18	**54**	S	9
40	18H41A0246	16	17	17	**50**	S	9
41	18H41A0247	16	17	17	**50**	S	9
42	18H41A0248	20	20	20	**60**	O	10
43	18H41A0249	16	16	16	**48**	S	9
44	18H41A0250	20	19	19	**58**	O	10
45	18H41A0251	17	18	19	**54**	S	9
46	18H41A0252	20	20	20	**60**	O	10
47	18H41A0253	20	19	19	**58**	O	10
48	18H41A0254	20	19	19	**58**	S	9
49	18H41A0255	16	18	18	**52**	S	9
50	19H45A0201	17	18	19	**54**	S	9
51	19H45A0202	20	20	20	**60**	O	10
52	19H45A0203	17	17	18	**52**	S	9
53	19H45A0204	20	19	19	**58**	O	10
54	19H45A0205	20	19	19	**58**	O	10
55	19H45A0206	20	20	20	**60**	O	10
56	19H45A0207	20	19	19	**58**	S	9
57	19H45A0208	20	19	19	**58**	O	10
58	19H45A0209	20	19	19	**58**	O	10
59	19H45A0210	18	19	19	**56**	O	10
60	19H45A0211	20	20	20	**60**	O	10
61	19H45A0212	18	19	19	**56**	S	9
62	19H45A0213	20	20	20	**60**	O	10
63	19H45A0214	17	17	18	**52**	S	9
64	19H45A0216	16	16	16	**48**	S	9
65	19H45A0217	20	19	19	**58**	O	10
66	19H45A0219	20	19	19	**58**	O	10
67	19H45A0220	17	18	19	**54**	S	9
68	19H45A0221	20	20	20	**60**	O	10
69	19H45A0222	20	19	19	**58**	O	10
70	19H45A0223				**0**		
71	19H45A0224	16	17	17	**50**	S	9
72	19H45A0225	20	20	20	**60**	O	10
73	19H45A0227	17	18	19	**54**	S	9
74	19H45A0228	20	20	20	**60**	O	10
75	19H45A0229	20	19	19	**58**	S	9
76	19H45A0230	17	18	19	**54**	S	9
77	19H45A0231	17	18	19	**54**	S	9
78	19H45A0232	20	20	20	**60**	O	10
Class Average Mark		18	18	19	55	O	9
Student Scored above		36	46	55	47	77	38
Students attempted the ques		77	77	77	78	77	77
% students scored above		47	60	71	60	100	49

					Internal	University Exam	Over all
C426.1	2			2	2	2	2.00
C426.2	2			2	2	2	2.00
C426.3		2		2	2	2	2.00
C426.4		2		2	2	2	2.00
C426.5			3	2	2.5	2	2.15
C426.6			3	2	2.5	2	2.15
						Overall Course attainment	2.05
						Set target for course attainment	1.67
						Status of the course attainment (Yes/No)	Yes

C426.1	Applying	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts.
C426.2	Evaluating	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources
C426.3	Applying	Student can apply and simulate the result by using different softwares or possible extend that result as a prototype
C426.4	Applying	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.
C426.5	Evaluating	Compare the result of their work to improve the quality of work
C426.6	Creating	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel.

Base Target taken for CO: Class average Mark

Rubrics:

>65% students	3		
50 to 65% students	2	Best performing Course Outcome:	C426.5, C426.6
<45 % students	1	Least performing Course Outcome:	C426.1, C426.2, C426.3 AND C426.4

Reason for low attainment:	1	
	2	
	3	
Plan of Action for improvement		
	1	Students have to improve thir practical knowledge
	2	
	3	

Faculty Signature