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REPORT OF CO – PO ASSESSMENT AND ATTAINMENT

Of

FACULTY OF ELECTRICAL & ELECTRONICS ENGINEERING

Submitted

By

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

KASHI INSTITUTE OF TECHNOLOGY, VARANASI

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CO-PO ASSESSMENT & ATTAINMENT

1. INTRODUCTION:

According to John Dewey, an American philosopher, psychologist and educational reformer, "Education is not preparation for life, education is life itself". Education is a form of teaching-learning-practicing in which the knowledge, skills and information are transferred from teachers to students. But the traditional system of education fails to measure the Capability of the students. It only assesses the students learning by allowing them to reproduce the exact text presented in the text book as answer for questions. But the real need and demand of twenty first century learning system is the transition from Output Based Education to Outcome Based Education. Outcome Based Education (OBE) system is able to measure what the students are capable of doing. Indian education system has introduced the

Outcome Based Education System through National Board of Accreditation (NBA). This is a model which not only gives much better technical knowledge to twenty first century engineers, but also gives emphasis on the development of affective domain attribute which are needed in workplace, e.g. interpersonal skills, analytical skills, computer skills, Organizational skills, leadership skills, self-confidence, creativity, strong work ethics, Motivation, initiative, flexibility, adaptability and entrepreneurial skills. This report described

the calculation of various courses like Engineering Physics, Engineering Chemistry, Engineering Mathematics-1,Elementry mathematics-1, Soft Skill, Fundamental of Mechanical Engineering & Mechotronics, Basic Electrical Engineering, Emerging Technology, Artificial Intelligence, Programming for Problem Solving, Emerging Domain in Electronics Engineering, etc), delivery methods to attain OBE in these Programs, presents assessment methods, attainment of Course Outcome (CO) ,Program Outcome (PO) & Program Specific Outcome (PSO).The goal of outcome-based education (OBE) is to have students demonstrate that they "**know and are able to achieve**" whatever they required outputs are by organizing and focusing the resources available in an educational system. OBE assists universities in tracking their students' academic progress and empowering them to master new talents that will set them apart from their peers throughout the world. The curriculum is revised as needed to meet the needs of today's students, rather than being repeated for the following generation of students. The faculty is encouraged to focus on helping the students build new abilities rather than placing too much emphasis on getting everything done on the syllabus before the end of the semester. Additionally, students are evaluated based on the 'Levels' that track their learning skills rather than their grade. Success for all students and staff is the Outcome Based Education (OBE) principle, as stated by ensuring that every student has the skills, abilities, and qualities required for success after leaving the educational system. Organizing institution is a way that allows for the achievement and maximization of those Outcomes for all students. Institutions adopting OBE attempt to carry changes to the educational program by progressively adapting to the requirements of the various stakeholders like Students, Parents, Industry Personnel and Recruiters. This report described the calculation of various technical and non technical courses. Delivery methods to attain OBE in Engineering Program, presents assessment methods, attainment of course outcome (COs) and program outcome (POs).

2- Institute Vision & Mission

Vision:

To empower young generation for substantial contribution to economical, technological and social progress of the society worldwide.

Mission:

- To contribute to the development of the human resources in the form of professional leaders of global cadre.
- To develop holistic personality of the learners.
- To make this Institute as a Leading Centre of Research.

3-DEPARTMENT OF ELECTRICALS AND ELECTRONICS ENGINEERING: Vision & Mission

VISION:

To become a Central of Excellence in the Electricals and Electronics Engineering producing innovation and creative to meet the global challenges.

MISSION:

To provide a favorable platform to the students in order to help them attain quality education in Electricals and Electronics Engineering. To educate students about professional and ethical responsibility and trained them to build leadership and entrepreneurship qualities for their career development to create opportunities and guide students in acquiring career-oriented jobs in the field of Electricals and Electronics Engineering.

4-LEVELS OF OUTCOMES:

Terminology (Abbreviations)

•Outcomes Based Education (OBE): Outcome-Based Education (OBE) is a student-centric teaching and learning Methodology in which the course delivery, assessment are planned to achieve stated Objectives and Outcomes. It focuses on measuring student performance i.e. outcomes at different levels.

OBE is all about feedback and outcomes there are four levels of Outcomes from OBE are:

1-Course Outcomes (COs) 2-Program Outcomes (POs)

3-Program Educational Objectives (PEOs) 4-Program Specific Outcomes (PSOs)

•Course Outcomes (COs):

Course Outcomes (COs) are what the student should be able to do at the end of a course. The most important aspect of a CO is that it should be observable and measurable form of a set of individually assessable outcomes of the programme. Graduates Attributes (GAs) are the components indicative of the graduate's potential to acquire competence to practice at the appropriate level.

•Program Outcomes (POs):

Program outcomes are statements that describe what the knowledge, skills and attitudes students should have at the time of graduation from an engineering program. That means just at the end of 4 years these represent what is the knowledge, skills and attitudes they should have.

- **Program Educational Objectives (PEOs):**

These are broad statements that describe the career and professional accomplishments in four to five years after graduation that the program is preparing the graduates to achieve.

- **Program Specific Outcomes (PSOs):**

Program Specific Outcomes are statements that describe what the students of a specific engineering program should be able to do.

Course objectives:

1. Intended outcomes written to help guide instruction for what the students will learn in the course.

2. Course objectives are measurable objectives that the learner is expected to accomplish at the end of an instructional.

3. A statement of an action that a learner should be able to perform after successfully completing the learning material. e.g. course objective of RES.

Course objective of Renewable Energy Resources:

To create awareness among the students about the different types of non-conventional energy resources and emphasize its importance.

COURSE OUTCOME STATEMENT:

Course Outcomes (COs):

CO statements indicating what a student can do after the successful completion of a course. Every Course leads to some Course Outcomes. The CO statements are defined by considering the course content covered in each module of a course. For every course there may be 5 or 6 COs. The keywords used to define COs are based on Bloom's Taxonomy. A well written CO facilitates lecturers in measuring the achievement of the CO at the end of the semester. It also helps the lecturers in designing suitable delivery and assessment methods to achieve the designed CO. Graduates Attributes (GAs) are the components indicativeof the graduate's potential to acquire competence to practice at the appropriate level. Gas form a set of individually assessable outcomes of the programmed. For e.g. a course such as Engineering Chemistry might have the following course outcomes set.

Course Outcomes & CO-PO Matrix of Various Courses

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING		
COURCE_OUTCOME		
ODD SEMESTER		
Course Outcomes		BL
Course 1 -RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING(KHU701)		
S.No.	Course Outcome/ Unit	
1	Students can understand the definitions, concepts and components of Rural Development	K1
2	Students will know the importance, structure, significance, resources of Indian rural economy	K1,K2
3	Students will have a clear idea about the area development programmes and its impact.	K1
4	Students will be able to acquire knowledge about rural entrepreneurship.	K1
5	Students will be able to understand about the using of different methods for human resource planning	K1,K2

Course Outcomes		BL
Course 2 -Wireless & Mobile Communication(KEC076)		
S.No.	Course Outcome/ Unit	
1	Express the basic knowledge of mobile radio & cellular communication fundamentals and their application to propagation mechanisms, path loss models and multi-path phenomenon.	K1
2	Apply the knowledge of wireless transmission basics to understand the concepts of equalization and multiple access techniques.	K4
3	Apply the knowledge of wireless transmission basics to understand the concepts of equalization and multiple access techniques.	K4
4	Examine the performance of cellular systems being employed such as GSM, CDMA and LTE using various theoretical and mathematical aspects.	K2
5	Express basic knowledge of Mobile Adhoc networks and the existing & upcoming data communication networks in wireless and mobile communication domain.	K1,K2

Course Outcomes		BL
Course 3 -Optical Network (KEC073)		
S.No.	Course Outcome/ Unit	
1	Express the multiplexing techniques, second generation optical networks, optical layer, and optical packet switching.	K1
2	Explain the concept of Principles of operation, Conservation of energy, Isolators and Circulators: Principles of operation.	K1,K2
3	Classify the basics of Multiplexing, SONET/SDH layers, SONET Frame structure, SONET/SDH physical layer, Elements of a SONET/SDH infrastructure.	K2
4	Interpret the knowledge of Routing and wavelength assignment problems, Dimensioning Wavelength Routing Networks, Network Survivability.	K3
5	Analyse the working of OTDM, Synchronization, Header Processing, Buffering, Burst Switching, Deployment Considerations- SONET/SDH core Network.	K2

Course Outcomes		BL
Course 4 -RENEWABLE ENERGY RESOURCES (KOE074)		
S.No.	Course Outcome/ Unit	
1	Identify and assess the energy conservation/saving opportunities in different electric system and understand related legislations.	K1
2	Identify and assess the energy saving behavior of utilities through implementation of DSM and EMIS.	K1
3	Explain energy audit & management and to prepare energy audit report for different energy conservation instances.	K2
4	Illustrate the energy audit for Mechanical Utilities.	K3
5	Describe cost-effective measures towards improving energy efficiency and energy conservation by implementation of energy efficient technologies.	K2

Course Outcomes		BL
Course 5 -Optical System and Networking Lab (KEC753C)		
S.No.	Course Outcome/ Unit	
1	Define the concept of Optical Systems and Networking.	K1
2	Indentify the various types of cables, connectors, routers and switches.	K1
3	Design the various networking protocols.	K2
4	Create various fiber optic link.	K3
5	Interpret the basic knowledge of multiplexing and coding-decoding.	K1

Course Outcomes		BL
Course 6 -Integrated Circuit (KEC501)		
S.No.	Course Outcome/ Unit	
1	Explain complete internal analysis of Op-Amp 741-IC.	K1
2	Examine and design Op-Amp based circuits and basic components of ICs such as various types of filter.	K1,K2
3	Implement the concept of Op-Amp to design Op-Amp based non-linear applications and wave-shaping circuits.	K2
4	Analyse and design basic digital IC circuits using CMOS technology.	K2
5	Describe the functioning of application specific ICs such as 555 timer ,VCO IC 566 and PLL.	K1

Course Outcomes		BL
Course 7-Microprocessor & Microcontroller (KEC502)		
S.No.	Course Outcome/ Unit	
1	Demonstrate the basic architecture of 8085.	K1
2	Illustrate the programming model of microprocessors & write program using 8085 microprocessor.	K1
3	Demonstrate the basics of 8086 Microprocessor and interface different external Peripheral Devices like timer, USART etc. with Microprocessor (8085/8086).	K1,K2
4	Compare Microprocessors & Microcontrollers, and comprehend the architecture of 8051 microcontroller	K2
5	Illustrate the programming model of 8051 and implement them to design projects on real time problems.	K2,K3

Course Outcomes		BL
Course 8 -Digital Signal Processing (KEC503)		
S.No.	Course Outcome/ Unit	
1	Design and describe different types of realizations of digital systems (IIR and FIR) and their utilities.	K2
2	Select design parameters of analog IIR digital filters (Butterworth and Chebyshev filters) and implement various methods such as impulse invariant transformation and bilinear transformation of conversion of analog to digital filters.	K3
3	Design FIR filter using various types of window functions.	K3
4	Define the principle of discrete Fourier transform & its various properties and concept of circular and linear convolution. Also, students will be able to define and implement FFT i.e. a fast computation method of DFT.	K1
5	Define the concept of decimation and interpolation. Also, they will be able to implement it in various practical applications.	K1

Course Outcomes		BL
Course 9 -Computer Architecture and Organization (KEC051)		
S.No.	Course Outcome/ Unit	
1	Discuss about the basic concepts of system design methodology and processor level design.	K1
2	Explain the basics of processor and basic formats of data representation.	K1
3	Perform fixed and floating point arithmetic operations.	K2
4	Describe the basic concepts of control design and pipeline performance.	K1
5	Explain the architecture and functionality of central processing unit.	K1

Course Outcomes		BL
Course 10 -Electronics Measurement & Instrumentation (KEC057)		
S.No.	Course Outcome/ Unit	
1	Classify the Instrumentation and Measurement system and various measurement errors.	K2
2	Analyze and design voltmeter circuits, AC electronic voltmeter, digital frequency meter and current measurement with electronic instruments.	K1,K2
3	Evaluate various resistance and impedance measuring methods using Bridges and Q-meter.	K1
4	Analyze fundamental operation of CRO and some special type of oscilloscopes like DSO, Sampling oscilloscope.	K1
5	Demonstrate calibration method to calibrate various instruments and classify transducers like for force, pressure, motion, temperature measurement etc.	K1,K2

Course Outcomes		BL
Course 11 -Integrated Circuit Lab (KEC551)		
S.No.	Course Outcome/ Unit	
1	Design different non-linear applications of operational amplifiers such as log, antilog amplifiers and voltage comparators.	K3
2	Explain and design different linear applications of operational amplifiers such as filters.	K1
3	Demonstrate the function of waveforms generator using op-Amp.	K1
4	Construct multivibrator and oscillator circuits using IC555 and IC566 and perform measurements of frequency and time.	K4
5	Design and practically demonstrate the applications based on IC555 and IC566.	K4

Course Outcomes		BL
Course 12 -Microprocessor & Microcontroller Lab (KEC552)		
S.No.	Course Outcome/ Unit	
1	Use techniques, skills, modern engineering tools, instrumentation and software/hardware appropriately to list and demonstrate arithmetic and logical operations on 8 bit data using microprocessor 8085.	K1
2	Examine 8085 & 8086 microprocessor and its interfacing with peripheral devices.	K1
3	State various conversion techniques using 8085 & 8086 and generate waveforms using 8085.	K1
4	Implement programming concept of 8051 Microcontroller.	K2
5	Design concepts to Interface peripheral devices with Microcontroller so as to design Microcontroller based projects.	K4

Course Outcomes		BL
Course 13 -Digital Sigal Processing (KEC553)		
S.No.	Course Outcome/ Unit	
1	Create and visualize various discrete/digital signals using MATLAB/Skylab.	K3
2	Implement and test the basic operations of Signal processing.	K2
3	Examine and analyze the spectral parameters of window functions.	K2
4	Design IIR and FIR filters for band pass, band stop, low pass and high pass filters.	K4
5	Design the signal processing algorithms using MATLAB/Skylab.	K4

Course Outcomes		BL
Course 14 -Constitution of India, Law and Engineering (KNC501)		
S.No.	Course Outcome/ Unit	
1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	K2
2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	K2
3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	K2
4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	K2
5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	K2

Course Outcomes		BL
Course 15 -Material Science (KOE03)		
S.No.	Course Outcome/ Unit	
1	This course provide knowledge about Phase diagram of different materials	K1,K2
2	This course deals with the different features of ferrous alloys.	K2
3	This course deals with the mechanical properties of the materials.	K1
4	This course provide knowledge about magnetic properties of material.	K2
5	This course deals with the study of new materials such as ceramics and nanomaterial.	K2

Course Outcomes		BL
Course 16 -Universal Human Values (KVE301)		
S.No.	Course Outcome/ Unit	
1	To acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.	K2
2	To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.	K2
3	To channelize students' thinking towards basic understanding of the legal concepts and its implications for engineers.	K2
4	To acquaint students with latest intellectual property rights and innovation environment with related regulatory framework.	K2
5	To make students learn about role of engineering in business organizations and e-governance.	K3

Course Outcomes		BL
Course 17 -Electronic Device (KEC301)		
S.No.	Course Outcome/ Unit	
1	Understand the principles of semiconductor Physics.	
2	Understand and utilize the mathematical models of semiconductor junctions.	K1
3	Understand carrier transport in semiconductors and design resistors.	K2,K3
4	Utilize the mathematical models of MOS transistors for circuits and systems.	K1
5	Analyse and find application of special purpose diodes.	K2

Course Outcomes		BL
Course 18 -Digital System Design (KEC302)		
S.No.	Course Outcome/ Unit	
1	Design and analyze combinational logic circuits.	K3
2	Design and analyze modular combinational circuits with MUX / DEMUX, Decoder & Encoder	K3
3	Design & analyze synchronous sequential logic circuits	K3
4	Analyze various logic families.	K2
5	Design ADC and DAC and implement in amplifier, integrator, etc.	K3

Course Outcomes		BL
Course 19 -Network Analysis and Synthesis (KEC303)		
S.No.	Course Outcome/ Unit	
1	Understand basics electrical circuits with nodal and mesh analysis.	K1
2	Appreciate electrical network theorems.	K1,K2
3	Apply Laplace transform for steady state and transient analysis.	K2
4	Determine different network functions.	K2
5	Appreciate the frequency domain techniques.	K2

Course Outcomes		BL
Course 20 -Electronic Device Lab (KEC351)		
S.No.	Course Outcome/ Unit	
1	Understand working of basic electronics lab equipment.	K1
2	Understand working of PN junction diode and its applications.	K1
3	Understand characteristics of Zener diode.	K1
4	Design a voltage regulator using Zener diode.	K3
5	Understand working of BJT, FET, MOSFET and apply the concept in designing of amplifiers.	K2

Course Outcomes		BL
Course 21 -Digital System Design Lab (KEC352)		
S.No.	Course Outcome/ Unit	
1	Design and analyze combinational logic circuits.	K3
2	Design & analyze modular combinational circuits with MUX/DEMUX, decoder, encoder.	K3
3	Design & analyze synchronous sequential logic circuits.	K3
4	Design & build mini project using digital ICs.	K4

Course Outcomes		BL
Course 22 -Network Analysis and Synthesis Lab (KEC353)		
S.No.	Course Outcome/ Unit	
1	Understand basics of electrical circuits with nodal and mesh analysis.	K1
2	Appreciate electrical network theorems.	K2
3	Analyse RLC circuits.	K2
4	Determine the stability of an electrical circuit.	K1
5	Design network filters.	K3

Course Outcomes		BL
Course 23 -Computer System Security (KNC301)		
S.No.	Course Outcome/ Unit	
1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	K1 & K2
2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	K2
3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K3
4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	K4
5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K5 & K6

EVEN SEMESTER

Course Outcomes		BL
Course 1 -PROJECT MANAGEMENT & ENTREPRENEURSHIP (KHU802)		
S.No.	Course Outcome/ Unit	
1	This course provide a brief understanding of need, scope and concept of Entrepreneurship.	K1
2	This course provide the importance of entrepreneurial idea, management skills & enterprising model	K2
3	This course provide the meaning, scope and importance of project management, role of project manager	K2
4	This course provide knowledge about project financing	K2
5	This course provide clear idea about social entrepreneurship	K2

Course Outcomes		BL
Course 2 - INTRODUCTION TO SMART GRID (KOE084)		
S.No.	Course Outcome/ Unit	
1	This course provides a platform for brief understanding of smart features of an electric grid.	K2
2	This course provides knowledge about smart power grids, design criteria and technology.	K3
3	This course provides knowledge about information processing and communications to the power grid.	K2
4	This course provides a platform to know about the act of micro grid and And proper distribution of energy resources.	K2
5	This course provide how to manage power quality and also enhance the real time monitoring of the power quality.	K2

Course Outcomes		BL
Course 3 - DIGITAL AND SOCIAL MEDIA MARKETING (KOE094)		
S.No.	Course Outcome/ Unit	
1	This course deals with the Shift from traditional to digital marketing.	K1
2	This course provide information regarding different means of social media marketing.	K1,K3
3	This course deals with impact of content and branding on the sales and importance of SEO.	K2
4	This course deals with the designing organization for digital success.	K3
5	This course provide information regarding digital transformation framework.	K1

Course Outcomes		BL
Course 4 - Digital Communication (KEC601)		
S.No.	Course Outcome/ Unit	
1	To formulate basic statistics involved in communication theory.	K1
2	To demonstrate the concepts involved in digital communication.	K1
3	To explain the concepts of digital modulation schemes.	K2
4	To analyze the performance of digital communication systems.	K2
5	To apply the concept of information theory in digital systems.	K3

Course Outcomes		BL
Course 5 - Control System (KEC602)		
S.No.	Course Outcome/ Unit	
1	Describe the basics of control systems along with different types of feedback and its effect. Additionally they will also be able to explain the techniques such as block diagrams reduction, signal flow graph and modeling of various physical systems along with modeling of DC servomotor.	K2
2	Explain the concept of state variables for the representation of LTI system.	K2
3	Interpret the time domain response analysis for various types of inputs along with the time domain specifications.	K2
4	Distinguish the concepts of absolute and relative stability for continuous data systems along with different methods.	K2
5	Interpret the concept of frequency domain response analysis and their specifications.	K1,K2

Course Outcomes		BL
Course 6 - Antenna and Wave Propagation (KEC603)		
S.No.	Course Outcome/ Unit	
1	Identify different coordinate systems and their applications in electromagnetic field theory to establish a relation between any two systems using the vector calculus.	K2
2	Explain the concept of static electric field, current and properties of conductors.	K1
3	Express the basic concepts of ground, space, sky wave propagation mechanism.	K2
4	Demonstrate the knowledge of antenna fundamentals and radiation mechanism of the antenna.	K3
5	Analyze and design different types of basic antennas.	K2

Course Outcomes		BL
Course 7 - Data Communication Network (KEC063)		
S.No.	Course Outcome/ Unit	
1	Identify the issues and challenges in the architecture of a network.	K1
2	Analyze the services and features of various protocol layers in data layer.	K2
3	Demonstrate the knowledge of multiple access to design a access technique for a particular application.	K2
4	Realize protocols at different layers of a network hierarchy.	K2
5	Recognize security issues in a network and various application of application layer.	K2

Course Outcomes		BL
Course 8 - IDEA TO BUSINESS MODEL (KOE060)		
S.No.	Course Outcome/ Unit	
1	This course can motivate students to have an overall idea how to start and sustain a business enterprise.	K1
2	The students will learn basics of choosing an idea of a business model.	K1
3	The core areas of choosing a business model are encompassed with Entrepreneurship development, PPC & communication system. The students will thus develop basic competencies how to run a business enterprise.	K1 & K2

Course Outcomes		BL
Course 9 - Digital Cominication Lab (KEC651)		
S.No.	Course Outcome/ Unit	
1	To formulate basic concepts of pulse shaping in digital communication.	K1
2	To identify different line coding techniques and demonstrate the concepts.	K1,K2
3	To design equipments related to digital modulation and demodulation schemes.	K3
4	To analyze the performance of various digital communication systems and evaluate the key parameters.	K2
5	To conceptualize error detection & correction using different coding schemes in digital communication.	K1,K2

Course Outcomes		BL
Course 10 - Control System Lab (KEC652)		
S.No.	Course Outcome/ Unit	
1	Classify different tools in MATLAB along with the basic matrix operations used in MATLAB.	K1
2	Evaluate the poles and zeros on s-plane along with transfer function of a given system.	K1
3	Construct state space model of a linear continuous system.	K2
4	Appraise the steady state error of a given transfer function.	K2
5	Evaluate the various specifications of time domain response of a given system.	K3
6	Examine the relative stability of a given transfer function using various methods such as root locus, Bode plot and SyQuest plot.	K2

Course Outcomes		BL
Course 11 - Measurement& Instrumentation Lab (KEC652)		
S.No.	Course Outcome/ Unit	
1	Measure the unknown resistance, capacitance and inductance using LCR Bridge, Kelvin double bridge, Schering bridge, Hay's bridge, De sauty bridge.	**K1**
2	Practically demonstrate the different types of transducers like J-type, K-type, PT -100 and RTD.	**K1**
3	Interpret frequency and phase difference from Lissajous figure.	**K1**
4	Interpret hybrid parameters of transistor and demonstrate different transducer like LDR and LVDT.	**K1**
5	Demonstrate Experiment using PLC Trainer Kits	**K2**

Course Outcomes		BL
Course 12 - Indian Tradition, Culture and Society (KNC602)		
S.No.	Course Outcome/ Unit	
1	The course aims at imparting basic principles of thought process, reasoning and inference to identify the roots and details of some of the contemporary issues faced by our nation and try to locate possible solutions to these challenges by digging deep into our past.	**K2**
2	To enable the students to understand the importance of our surroundings and encourage the students to contribute towards sustainable development.	**K3**
3	To sensitize students towards issues related to 'Indian' culture, tradition and its composite character.	**K2**
4	To make students aware of holistic life styles of Yogic-science and wisdom capsules in Sanskrit literature that are important in modern society with rapid technological advancements and societal disruptions.	**K1**
5	To acquaint students with Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system.	**K1**

Course Outcomes		BL
Course 13 - Math-IV (KAS402)		
S.No.	Course Outcome/ Unit	
1	Apply different coordinate systems and their application in electromagnetic field theory, establish a relation between any two systems and also understand the vector calculus.	K_3
2	Understand the concept of static electric field. Understand the concept of current and properties of conductors. Establish boundary conditions and to calculate capacitances of different types of capacitors	K_4
3	Understand the concept of static magnetic field, magnetic scalar and vector potential	K_4
4	Understand the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors.	K_4
5	Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.	K_3

Course Outcomes		BL
Course 14 - Technical Communication (KAS401)		
S.No.	Course Outcome/ Unit	
1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers	K2
2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K2
3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K2
4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	K4
5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K4

Course Outcomes		BL
Course 15 - Communication Engineering (KEC401)		
S.No.	Course Outcome/ Unit	
1	Analyze and compare different analog modulation schemes for their efficiency and bandwidth.	K1,K1
2	Analyze the behavior of a communication system in presence of noise.	K2
3	Investigate pulsed modulation system and analyze their system performance.	K2
4	Investigate various multiplexing techniques.	K2
5	Analyze different digital modulation schemes and compute the bit error performance.	K2

Course Outcomes		BL
Course 16 - Analog Circuits (KEC402)		
S.No.	Course Outcome/ Unit	
1	Understand the characteristics of diodes and transistors.	K1
2	Design and analyze various rectifier and amplifier circuits.	K2,K3
3	Design sinusoidal and non-sinusoidal oscillators.	K3
4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K1
5	Design LPF, HPF, BPF, BSF.	K2

Course Outcomes		BL
Course 17 - Signal System (KEC403)		
S.No.	Course Outcome/ Unit	
1	Analyze different types of signals.	K2
2	Analyze linear shift-invariant (LSI) systems.	K2
3	Represent continuous and discrete systems in time and frequency domain using Fourier series and transform.	K1
4	Analyze discrete time signals in z-domain.	K2
5	Study sampling and reconstruction of a signal.	K1

Course Outcomes		BL
Course 18 - Communication Engineering Lab (KEC451)		
S.No.	Course Outcome/ Unit	
1	Analyze and compare different analog modulation schemes for their modulation factor and power.	K2
2	Study pulse amplitude modulation.	K2
3	Analyze different digital modulation schemes and can compute the bit error performance.	K2
4	Study and simulate the Phase shift keying.	K1
5	Design a front end BPSK modulator and demodulator.	K3

Course Outcomes		BL
Course 19 -Analog Circuits Lab (KEC452)		
S.No.	Course Outcome/ Unit	
1	Understand the characteristics of transistors.	K1
2	Design and analyze various configurations of amplifier circuits.	K3
3	Design sinusoidal and non-sinusoidal oscillators.	K3
4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K2
5	Design ADC and DAC.	K3

Course Outcomes		BL
Course 20 -Signal System Lab (KEC453)		
S.No.	Course Outcome/ Unit	
1	Understand the basics operation of MATLAB.	K1
2	Analysis the time domain and frequency domain signals.	K2
3	Implement the concept of Fourier series and Fourier transforms.	K2
4	Find the stability of system using pole-zero diagrams and bode diagram.	K2
5	Design frequency response of the system.	K2,K3

Course Outcomes		BL
Course 21 -Python Programming (KNC402)		
S.No.	Course Outcome/ Unit	
1	To read and write simple Python programs.	K1,L2
2	To develop Python programs with conditionals and loops.	K1,K4
3	To define Python functions and to use Python data structures — lists, tuples,dictionaries	K3
4	To do input/output with files in Python	K2
5	To do searching ,sorting and merging in Python	K2,K4

Program Outcomes (POs):

POs are defined by Accreditation Agencies of the country (NBA in India), which are the statements about the knowledge, skills and attitudes, graduate attributes of a formal engineering program should have. Graduates Attributes (GAs) are the components indicative of the graduate's potential to acquire competence to practice at the appropriate level. GAs form a set of individually assessable outcomes of the program. The NBA laid down the graduate attributes relating to program outcomes and is to be derived by Program. These are broad and cover a wider area than of COs. 12 Program Outcomes, or Graduate Attributes for the sake of unity and quality assurance.

The Program outcomes reflect the ability of graduates to demonstrate knowledge in fundamentals of Basic Sciences, Humanities and Social Sciences, Engineering Sciences and apply these principles in understanding and practically apply the knowledge in professional core subjects, electives and projects which enables the graduates to be competent at the time of graduation. The graduates must adhere to professional and ethical responsibilities in the pursuit of their careers and also for the benefit of the society. These outcomes also enable the graduate to pursue higher studies and engage in R&D for a successful professional career. The proper definition and the attainment of POs contribute to the attainment of Program Educational Objectives which will help the graduate to perform his/ her duties, professional responsibilities, design, development, production and testing of novel products, ability to deal with finances and project management during his/her early professional career of 3 to 4 years.

PROGRAM OUTCOMES (PO's)

PO1: Engineering Knowledge

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

PO2: Problems Analysis

Identity, formulates, review research literature and analyze Complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural Sciences and Engineering Sciences.

PO3: Design /Development of Solutions

Design solution for Complex engineering problems and design system components are 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 Problem

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.

- Those problems, as opposed to those presented at the end of chapters in a typical text book, cannot be solved by the straightforward application of knowledge, theories, and techniques applicable to the engineering discipline.
- That may not have a special answer. A design problem, for instance, can be solved in a variety of ways, leading to a variety of potential solutions
- That necessitates taking into account suitable restrictions or requirements, such as cost, power requirement, durability, product life, etc., which must be defined (modeled) within a suitable mathematical framework.
- This frequently necessitates the employment of cutting-edge computational ideas and methods, as in the case of designing an antenna or a DSP filter.

PO5: Modern Tool Usage

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

PO6: The Engineer and Society

Apply reasoning informed by the contextual knowledge to access 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 social and environmental contexts and demonstrate the knowledge need for sustainable development

PO8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practices.

PO9: Individual and Team Work

Function, effectively as an individual and as a member or leader in diverse teams 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 presentation and give and receive clear instructions.

PO11: Project Management and Finance

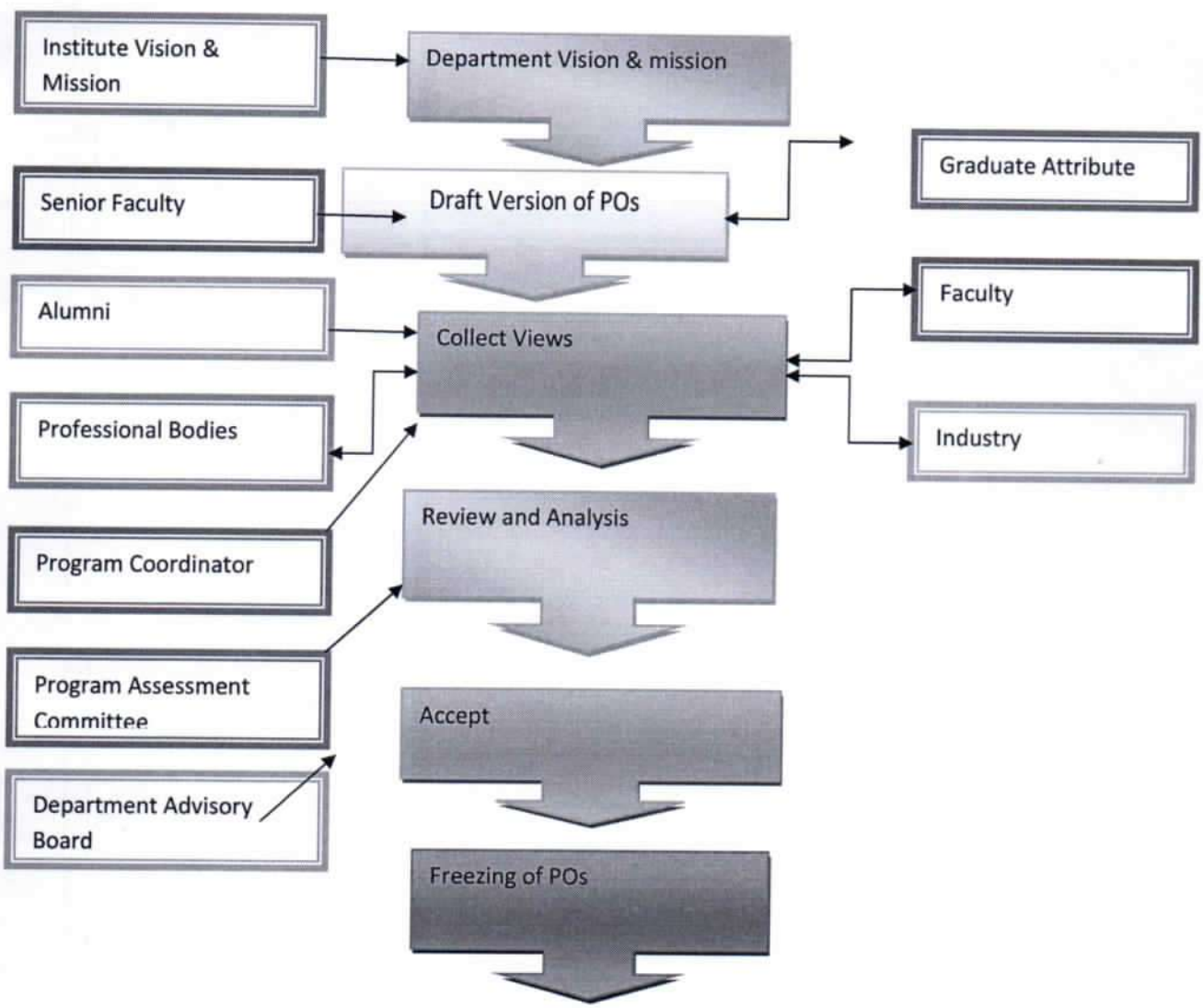
Demonstrate knowledge and understanding of Engineering and Management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments.

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 changes.

Process to define Program Outcomes (POs) of the department :

Fig. 1



PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

Program Educational Objectives (PEO) are statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4–5 years after graduation. They are set in order to measure the effectiveness of the program, and to check whether it has prepared the students to deal with the real world, where they could apply and use the skills and knowledge they've learned to good use.

PEO1 - PROFICIENT DEVELOPMENT

To develop in the students the capacity to obtain knowledge on Mathematics, Science and Engineering and apply it expertly inside sensible requirements, for example, financial, natural, social, political, moral, wellbeing and security, manufacturability and manageability with due moral obligation.

PEO2-CORE PROFICIENCY

To provide ability to recognize, plan, appreciate formulate, comprehend, analyze, design and solve engineering problems with hands on experience in different advancement involving modern tools necessary for engineering practice to fulfill the necessities of society and the business.

PEO3 - SPECIALISED ACHIEVEMENT

To furnished the students with the capacity to explore, reenact, design, simulate, experiment, analyze, optimize and interpret in their core applications through multi disciplinary ideas and contemporary figuring out how to incorporate them into industry prepared graduates.

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PEO4 - PROFESSIONALISM

To provide training, exposure and awareness on importance of soft skills for better career and holistic personality development as well as professional attitude towards ethical issues, team work, responsibility, accountability, multidisciplinary approach and capability to relate engineering issues to broader social context.

PEO5 - LEARNING ENVIRONMENT

To furnish students with an academic environment and make them mindful of greatness, foster the desire of revelation, imagination, creativity, authority, composed moral codes and rules and the long lasting figuring out how to turn into an effective expert in Electrical and Electronics Engineering.

The Process for Establishing the PEO's

The PEOs are established through the following process steps:

STEP 1: Vision and Mission of the Institute & Department are taken into consideration to interact with various stake holders, and establish the PEO's

STEP 2: The Head of the Department, Program Coordinator and other Senior Faculty prepares the draft version of PEOs and POs.

STEP 3: The draft rendition is examined with partners and their perspectives are gathered by the Program co-ordinator

STEP 4 : The Program Assessment Committee surveys and dissects the PEOs and POs and presents its recommendations to the Departmental advisory Board.

STEP 5: The Departmental advisory Board deliberates on the recommendations and freezes the PEOs and POs and submits them to the BOG for final approval. The Program curriculum is planned by integrating inputs from members of Board of Studies and Academic council who are drawn from various academic institutions, R&D associations and industry.

PROGRAM SPECIFIC OUTCOMES (PSOs):

The graduates of the department will attain:

PSO1: Problem tackling ability

Graduates will actually want to apply the capacity to break down, plan and carry out application explicit electronic framework for complex designing issues for simple, advanced area, correspondences and sign handling applications by applying the information on essential sciences, designing arithmetic and designing basics.

PSO2: Professional Skill

Graduates will actually want to foster quick changes in apparatuses and innovation with a comprehension of cultural and biological issues pertinent to proficient designing practice through long lasting learning.

PSO3: Successful Career Graduates will actually want to have great versatility to work in multi-disciplinary workplace, great relational abilities as a forerunner in a group in enthusiasm for proficient morals and cultural obligations.

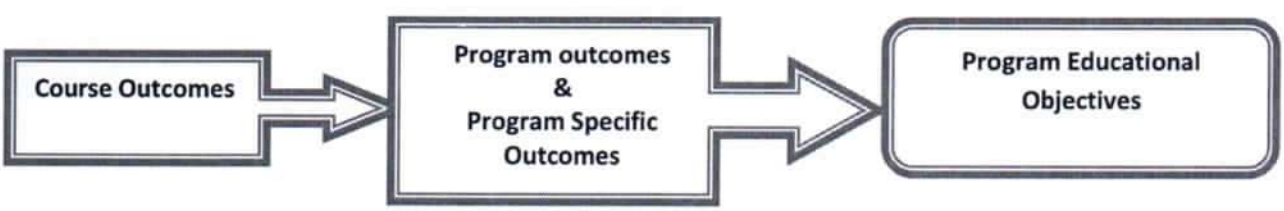


Fig 2. **Relating Outcomes (CO-PO & PSO-PEO**

This figure shows the building block of CO-PO & PSO-PEO Relationship. After CO statements Develop by course in-charge, CO will map with any possible POs based on the relationship exist between them. But all POs are not necessary mapped with one CO and it may be left blank. Anyhow, it is mandatory that all POs should be mapped with any one of PSO and PEO which are specified in the program.

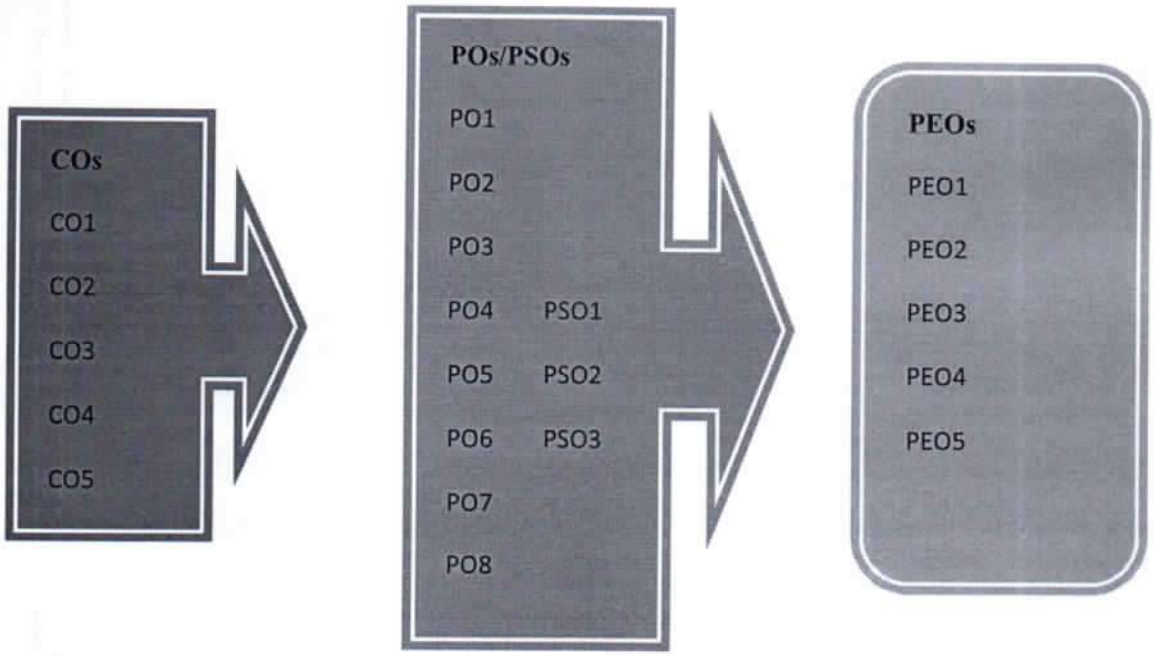


Fig. 3 **Relationship between CO, PO, PSO & PEO**

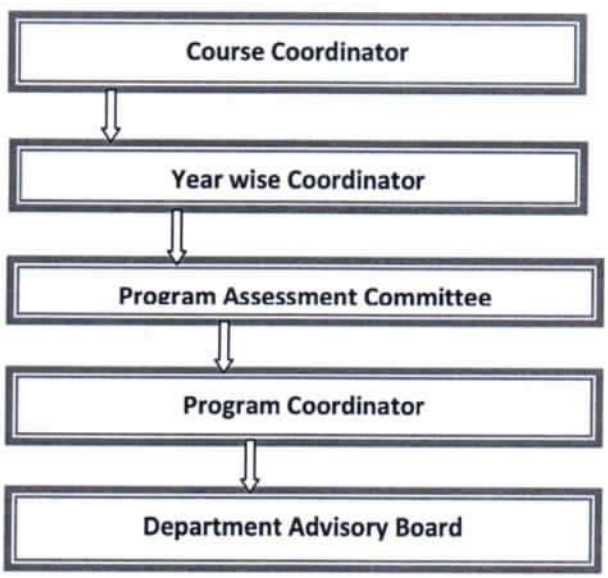


Fig.4 Hierarchy of Faculty Involvement

- **Course Coordinator**: write appropriate COs and finalize the CO-PO mapping.
- **Year wise Coordinator**: Consolidate the CO attainment of the respective year.
- **Program Assessment Committee**: Consolidate the CO attainment and PO attainment of the respective program.
- **Program Coordinator**: Monitor and Guide the Program Assessment Committee.
- **Department Advisory Board**: All these works mention above have to be done under the supervision of Department Advisory Board.

Vision, Mission & PEO are published & disseminated at following places:

Vision , Mission & PEOs			
Sr. No.	**Place of Dissemination**	**Item**	**Dissemination Detail**
1	College Website	Vision ,Mission, PEO	Permanent
2	Depart Area	Vision ,Mission, PEO	Permanent
3	Laboratory Area	Vision ,Mission, PEO	Permanent
4	Notice Board	Vision, Mission,	Permanent
5	Employer Survey Form	Vision ,Mission, PEO	When Required
6	Bulk SMS	Vision ,Mission,	At New Admission
7	Email	Vision ,Mission,	Footer in Every Mail
8	Home Page of ERP	Vision ,Mission,	Permanent
9	Laboratory Manuals	Vision ,Mission,	Permanent
10	Faculty Meetings	Vision ,Mission, PEO	At regular interval
11	In Alumni Interactions	Vision, Mission, PEO	Alumni Meet
12	Back Grounds of all Computers in the Department	Vision, Mission	Permanent

The Process for Updating Vision and Mission of Department:

The following steps are followed to establish Vision and Mission of Department.

Step 1: The Institute's Vision & Mission serve as the starting point in Step 1.

Step 2: The Department holds faculty discussions about the skill sets required by regional and global employers, industry technological breakthroughs, and R & D. A draft of the Department's vision and mission statements is also created in accordance with suggestions made by the Departmental Planning Committee.

Step 3: The draft version is changed in light of feedback from the Departmental Planning Committee, parents, professional organizations, and industry representatives.

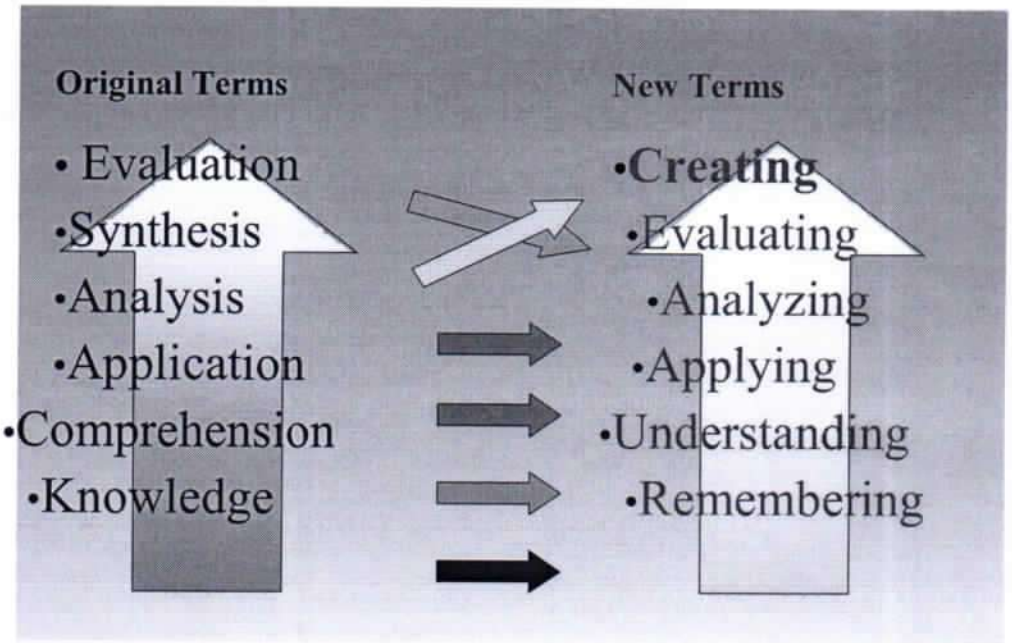
Step 4: To ascertain whether the accepted points of view are congruent with the institute's vision and goal. Should the Central Advisory Committee deem the Vision and Mission to be unsatisfactory move on to step 5.

Step 5: The Central Advisory Committee will again request changes from the Departmental Planning Committee if it is not happy with the Vision and Mission.

Step 6: The Vision and Mission are approved and made public among the stakeholders if they meet the requirements of the Central Advisory Committee.

5- Revised Bloom's Taxonomy (fig.5)

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



Critical thinking is a skill that you are expected to develop as you progress through University. Critical thinking will become part of your research, your reading, your planning and reflection and of your academic writing. It involves a set of skills and an attitude of mind that you will need to cultivate and practice - it won't necessarily come easily or naturally! If you can develop critical thinking skills in relation to your subject, they will be valuable to you in many other aspects of life (including employment).

Bloom's taxonomy of thinking and learning illustrates forms of thinking, in ascending order of complexity, from lower-order thinking skills (LOTS) to higher-order thinking skills (HOTS). It begins with **remembering** and ends with **creating**. This is used by lecturers to set learning outcomes and assessment criteria for a course or module, you will often find these verbs in your module handbooks. The knowledge about a subject alone, like having access to a range of information, or 'facts', is at the simplest or lowest level. So using only, or mostly, descriptive language in your writing, to communicate what you know about a topic is not likely to generate many marks. Higher and more complex levels include the ability to analyze, synthesize and evaluate information by comparing and contrasting different points of view, sets of information or experiences. This might involve recognizing patterns of behavior, for example, and using them to make predictions.

BLOOM'S REVISED TAXONOMY OF THINKING SKILLS Fig.6

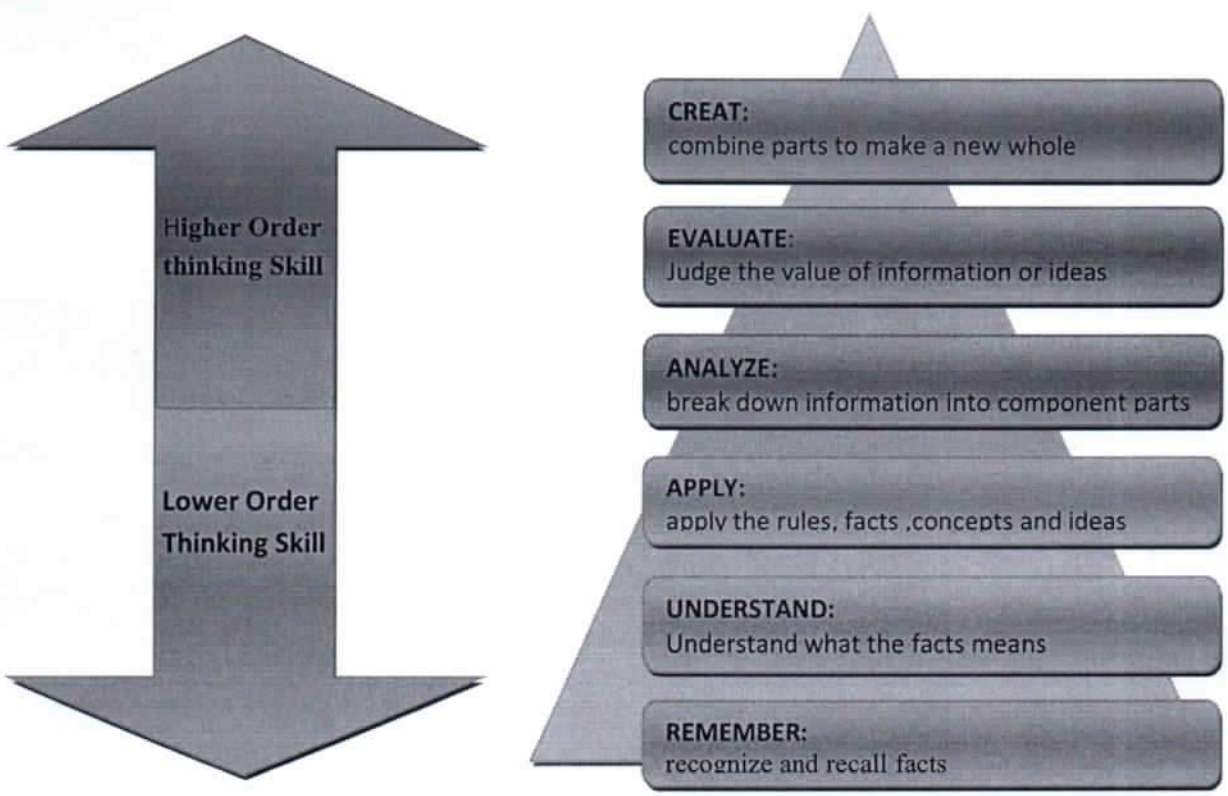
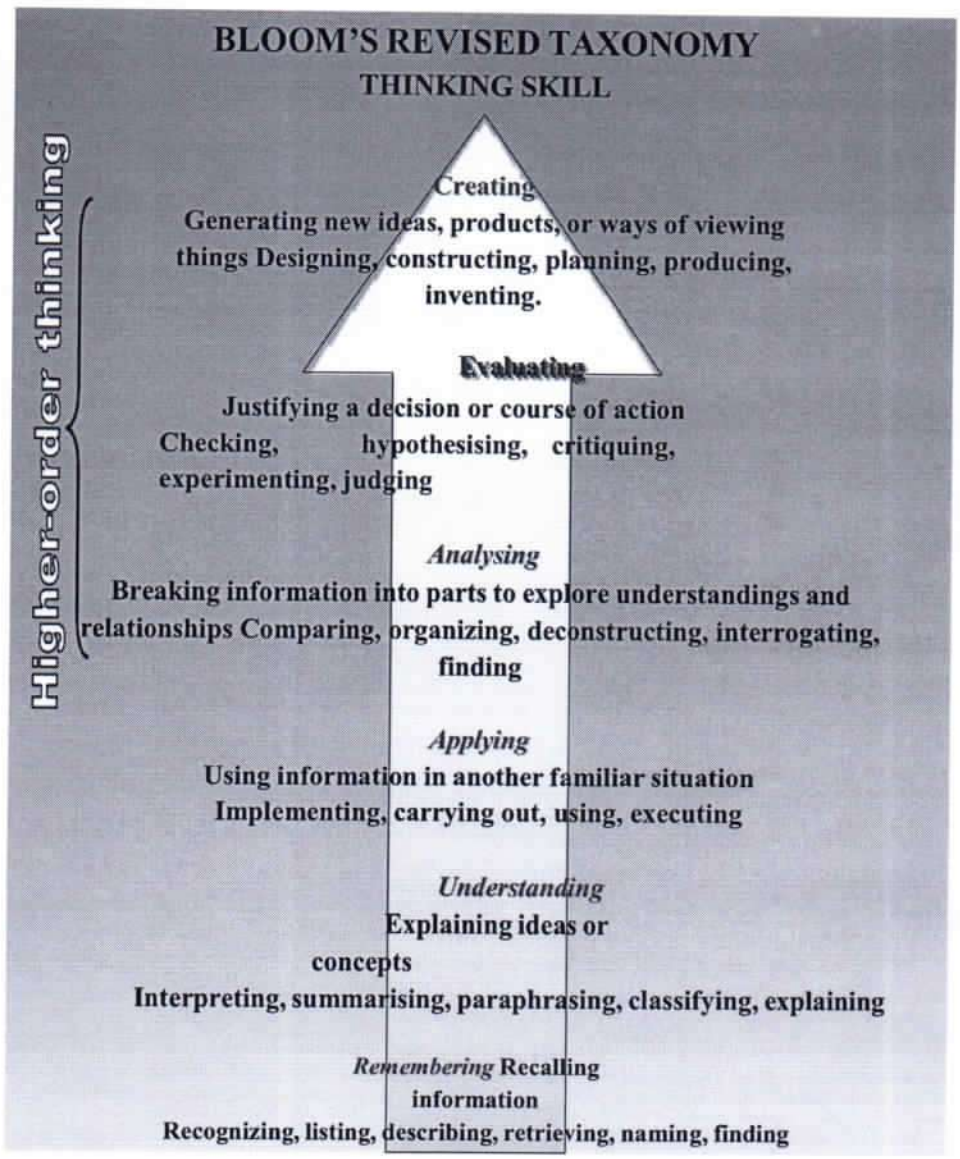


Fig.7


BLOOM'S REVISED TAXONOMY
THINKING SKILL
Higher-order thinking
Creating
Generating new ideas, products, or ways of viewing things Designing, constructing, planning, producing, inventing.
Evaluating
Justifying a decision or course of action
Checking, hypothesising, critiquing, experimenting, judging
Analysing
Breaking information into parts to explore understandings and relationships Comparing, organizing, deconstructing, interrogating, finding
Applying
Using information in another familiar situation
Implementing, carrying out, using, executing
Understanding
Explaining ideas or concepts
Interpreting, summarising, paraphrasing, classifying, explaining
Remembering Recalling information
Recognizing, listing, describing, retrieving, naming, finding

Cognitive processes: Level 1- C1

Categories & Cognitive Processes	Alternative Names	Definition
Apply		Applying a procedure to a familiar task
Executing	Carrying out	Applying a procedure to a familiar task
Implementing	Using	Applying a procedure to an unfamiliar task

Level- 2 C2

Categories & Cognitive Processes	Alternative Names	Definition
Understand		Construct meaning from instructional messages, including oral, written, and graphic communication
Interpreting	Clarifying Paraphrasing Representing Translating	Changing from one form of representation to another
Exemplifying	Illustrating Instantiating	Finding a specific example or illustration of a concept or principle
Classifying	Categorizing Subsuming	Determining that something belongs to a category
Summarizing	Abstracting Generalizing	Abstracting a general theme or major point(s)
Inferring	Concluding Extrapolating Interpolating Predicting	Drawing a logical conclusion from presented information
Comparing	Contrasting Mapping Matching	Detecting correspondences between two ideas, objects, and the like
Explaining	Constructing models	Constructing a cause and effect model of a system

Level- 3 C3

Categories & Cognitive Processes	Alternative Names	Definition
Remember		Retrieve knowledge from long- term memory
Recognizing	Identifying	Locating knowledge in long-term memory that is consistent with presented material
Recalling	Retrieving	Retrieving relevant knowledge from long-term memory

Analyze		Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose
Differentiating	Discriminating Distinguishing Focusing Selecting	Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material
Organizing	Finding coherence Integrating Outlining Parsing Structuring	Determining how elements fit or function within a structure
Attributing	Deconstructing	Determine a point of view, bias, values, or intent underlying presented material

Level-4 C4

Evaluate		Make judgments based on criteria and standards
Checking	Coordinating Detecting Monitoring Testing	Detecting inconsistencies or fallacies within a process or product; determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented
Critiquing	Judging	Detecting inconsistencies between a product and external criteria; determining whether a product has external consistency; detecting the appropriateness of a procedure for a given problem

Level- 5 C5

Categories & Cognitive Processes	Alternative Names	Definition
Create		Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure
Generating	Hypothesizing	Coming up with alternative hypotheses based on criteria
Planning	Designing	Devising a procedure for accomplishing some task
Producing	Constructing	Inventing a product

Level-6 c6

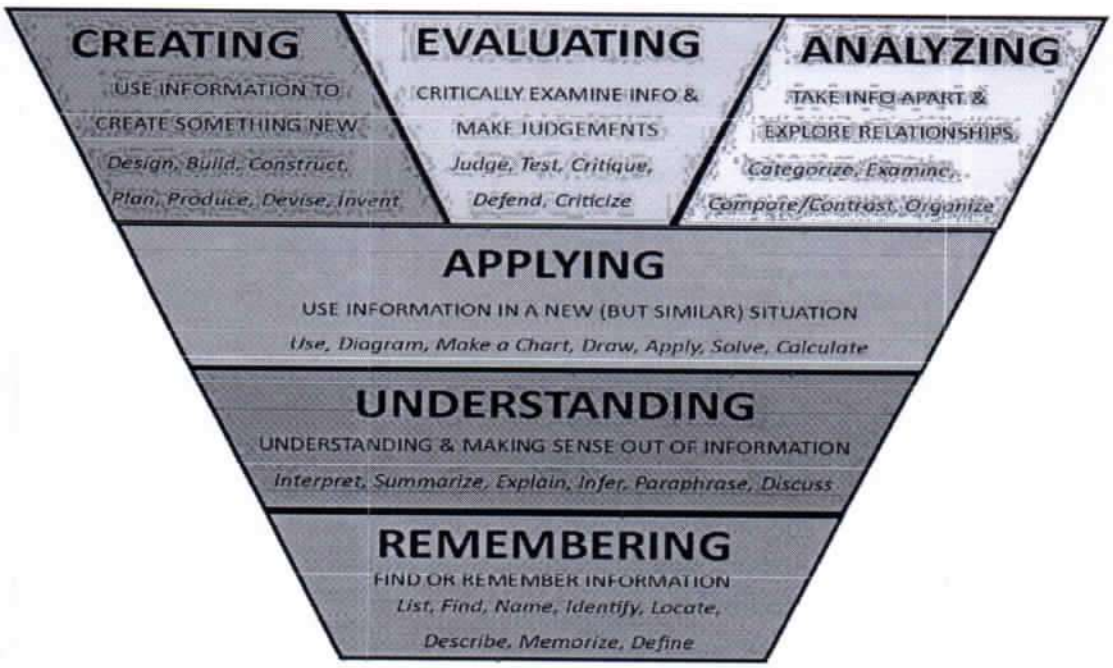


Fig-8 Pictorial representation of Blooms Taxonomy

The Knowledge Dimension

Dimension	Definition
Factual Knowledge	The basic elements students must know to be acquainted with a discipline or solve problems in it
Conceptual Knowledge	The interrelationships among the basic elements within a larger structure that enable them to function together
Procedural Knowledge	How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods
Met cognitive Knowledge	Knowledge of cognition in general as well as awareness and knowledge of one's own cognition

Cognitive Process 1: To Remember

Remembering consists of recognizing and recalling relevant information from long-term memory.

Verbs associated with this level:

Choose, define, describe, find, identify, label, list, locate, match, name, recall, recite, recognize, record, relate, retrieve, say, select, show, sort and tell

Cognitive Process 2: To understand

Understanding is the ability to make your own meaning from educational material such as reading and teacher explanations. The sub-skills for this process include interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

Verbs associated with this level:

Categorize, clarify, classify, compare, conclude, construct, contrast, demonstrate, distinguish, explain, illustrate, interpret, match, paraphrase, predict, represent, reorganize, summarize, translate and understand

Cognitive Process 3: To apply

Applying refers to using a learned procedure either in a familiar or new situation.

Verbs associated with this level:

Apply, carry out, construct, develop, display, execute, illustrate, implement, model, solve and use

Cognitive process 4: To Analyze

To analyze is to break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose. Students analyze by differentiating, organizing, and attributing.

Verbs associated with this level:
Analyze, ascertain, attribute, connect, deconstruct, determine, differentiate, discriminate, dissect, distinguish, divide, examine, experiment, focus, infer, inspect, integrate, investigate, organize, outline, reduce, solve (a problem) and test fo

Cognitive Process 5: To evaluate
To evaluate is to make judgments based on criteria and standards.

Verbs associated with this level:
Appraise, assess, award, check, conclude, convince, coordinate, criticize, critique, defend, detect, discriminate, evaluate, judge, justify, monitor, prioritize, rank, recommend, support, test, value

Cognitive Process 6: To Create
To create is to put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure; inventing a product. This skill involves putting things together to make something new. To accomplish creating tasks, learners generate, plan, and produce.

Verbs associated with this level:
Adapt, build, compose, construct, create, design, develop, elaborate, extend, formulate, generate, hypothesize, invent, make, modify, plan, produce, originate, refine, transform.

CO – PO AND CO – PSO MAPPING OF COURSES:
Mapping Factor (Correlation Level)

The role of CO-PO mapping will be assigned to the faculty as per hierarchy. The course in-charge is responsible for writing the necessary COs for their corresponding course after receiving the department's course (subject) allocation.. COs will be created utilizing the action verbs of the various learning levels., CO statements that are relevant to the skills, knowledge, and behavior that students will learn during the end of each course should be more specific and quantifiable.

After writing the CO statements, CO will be mapped with PO of the department. If the department is having more than one section in a year or the same course is available for more than one program of the same institute in a semester, the subject expert will be nominated as course coordinator of the corresponding course. The role of the course coordinator is to review the CO statements and the CO-PO mapping which has been done by course in-charge. The year wise coordinator has to consolidate the CO's of the respective year and maintain the documentation of the CO attainment level of the respective year courses as well as documentation of the individual students' extra-curricular and co-curricular activities. These details will hand over to the program coordinator in order to evaluate PO attainment of the individual student as well as individual course at the end of the 8th semester. The Program coordinator has to evaluate the PO attainment of individual student through direct and indirect method after the student completing their program. All these works have to be done under the guidance of Department Advisory Committee (DAC). CO – PO mapping indicates to what extent a certain component (either assessment method to CO or CO to PO or PO to PEO & PSO are correlated to each other. Course correlation matrix shows the **Learning Relationship** (level of learning achieved) between COs and POs of a course. This matrix also strongly indicates whether the students are able to achieve the course outcomes/objectives. All the courses together must cover all the POs and PSOs. For a course we map the COs to POs through the CO-PO matrix and to PSOs through the CO-PSO matrix. The matrix can be used for any course and it is good method to evaluate a course syllabus. The various correlation levels are:

* **3- indicates Substantial (high)** mapping (high contribution towards attainment)

* **2- indicates Moderate** (medium) mapping (medium contribution towards attainment)

* **1- indicates Slight (low)** mapping (some contribution towards attainment)

* **"-" indicates there is no correlation.**

Procedure followed while assigning the values by Mapping COs to POs:

Judging the importance of the particular COs in relation to the POs.

- If the CO matches strongly with a particular PO criterion then **Assign 3.**
- If it matches moderately then **Assign 2.**
- If the match is low then **Assign 1.**

- If there is no correlation between any CO with PO else mark with '-' **Symbol**

- If an action verb used in a CO is repeated at multiple Blooms levels, then we need to judge which Blooms level is the best fit for that action verb the first five POs are purely of **technical** in nature, while the other POs are **non-technical**.

- Writing the COs, we need to restrict ourself between Blooms Level 1 to Level 4. Again, if it is a programming course, restrict between Blooms Level 1 to Level 3 but for the other courses, we can go up to Blooms Level 4.

- For the laboratory courses, while composing COs, we need to restrict our self between Blooms Level 1 to Level 5.

- Only for Mini-project and Main project, you may extend up to Blooms Level 6 while composing COs.

Note: * The table given below gives information about the action verbs used in the POs and the nature of POs, stating whether the POs are technical or non-technical. we need to understand the intention of each POs and the Bloom's level to which each of **POs** and the Blooms level to which each of these action verbs in the POs correlates to. Once you have understood the **POs** then you can write the COs for a course and see to what extent each of those COs correlate with the POs.

Table 1: Process for mapping the values for CO-PO Matrix

Type	POs	Action Verb(s) in POs	Bloom's Level(s) for POs	Blooms Level(s) for COs
Technical	PO1	Apply	L3	Blooms L1 to L4 for Theory Courses
	PO2	Identify	L2	
		Formulate	L6	
		Review	L2	
	PO3	Design	L3,L6	
		Develop	L3,L6	Blooms L1 to L5 for Laboratory Courses
	PO4	Analyze	L4	
		Interpret	L2 , L3	
		Design	L6	Blooms L1 to L6 for Mini Project and Major Project
	PO5	Create	L6	
		Select	L1 , L2 L6	
		Apply	L3	
	PO6	Apply	L3	
		Assess	L5	

Type	Thumb Rule	
Non Technical	PO7	If Blooms L1 Action Verbs of a CO -> Correlates any of PO7 to PO12 -> then Assign 1
	PO8	If Blooms L2 to L3 Action Verbs of a CO -> Correlates any of PO7 to PO12 -> then Assign 2
	PO9	
	PO10	If Blooms L4 to L6 Action Verbs of a CO -> Correlates any of PO7 to PO12 -> then Assign 3
	PO11	
	PO12	

CO-PO & PSO MAPPING FOR CO-PO MATRIX: SAMPLE

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course : B.Tech
Course Code : KEE 401

Semester: IV

Academic Year:2021-2022
Course Name : Digital Electronics.

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CO 2	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2
CO 3	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2
CO 4	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2
CO 5	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course : B.Tech
Course Code : KEE 401

Semester: IV

Academic Year:2021-2022
Course Name : Electrical Machine-I

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	2	---	---	---	---	---	---	---	---	---	---	---	---	1	---
CO 2	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2
CO 3	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2
CO 4	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2
CO 5	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Course : B.Tech **Semester: VIII** **Academic Year: 2021-2022**
Course Code : KOE084 **Course Name : Introduction to Smart Grid**

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	2	1	2	3	1	1	-	2	2	2	1	2	1	1	3
CO 2	2	1	2	2	2	1	2	2	2	2	2	3	1	1	3
CO 3	2	2	2	2	2	1	-	1	2	2	3	2	2	1	2
CO 4	-	2	2	1	2	1	-	1	2	2	3	2	1	1	2
CO 5	-	1	2	1	-	1	2	1	2	2	2	2	1	1	2

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Cource : B.Tech **Semester: VI** **Academic Year:2021-2022**
Course Code : KEC 063 **Course Name : DCN**

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	2	1	2	2	-	-	-	-	-	-	-	-	3	1	0
CO 2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1
CO 3	2	1	2	0	-	-	-	-	-	-	-	-	1	-	-
CO 4	2	1	1	0	-	-	-	-	-	-	-	-	-	1	-
CO 5	2	1	1	0	-	-	-	-	-	-	-	-	-	1	-

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Cource : B.Tech
Course Code : KEC 057
Semester: V
Academic Year:2021-2022
Course Name : EMI

CO-PO & PSO MAPPING

		PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	2	1	2	2	-	-	-	-	-	-	-	-	3	1	-
CO 2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1
CO 3	2	1	2	-	-	-	-	-	-	-	-	-	1	-	-
CO 4	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-
CO 5	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Cource : B.Tech
Course Code : KEC 502
Name of the Faculty :
Semester:
Section : A
Academic Year:2021-2022
Course Name : MPMC

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	2	1	2	2	-	-	-	-	-	-	-	-	3	1	-
CO 2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1
CO 3	2	1	2	-	-	-	-	-	-	-	-	-	1	-	-
CO 4	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-
CO 5	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course : B.Tech **Semester: VIII** **Academic Year: 2021-2022**
Course Code : KHU 802

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	2	1	2	3	1	1	-	2	2	2	1	2	1	1	3
CO 2	2	1	2	2	2	1	2	2	2	2	2	3	1	1	3
CO 3	2	2	2	2	2	1	-	1	2	2	3	2	2	1	2
CO 4	-	2	2	1	2	1	-	1	2	2	3	2	1	1	2
CO 5	-	1	2	1	-	1	2	1	2	2	2	2	1	1	2

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course : B.Tech **Semester: III** **Academic Year:2021-2022**
Course Code : KEC 303 **Course Name : NAS**

CO-PO & PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	2	2	3	1	-	-	-	1	-	-	-	3	-	2
CO 2	2	2	2	2	1	1	1	-	1	-	-	1	3	-	1
CO 3	3	1	2	2	-	-	0	-	-	-	-	-	2	-	-
CO 4	2	2	2	1	-	-	0	-	-	-	-	-	2	-	-
CO 5	2	1	2	1	-	1	1	-	-	-	-	-	1	-	-

Attainment of Course Outcomes

In the Outcome Based Education (OBE), assessment is done through one or more than one processes, carried out by the department, that identify, collect, and prepare data to evaluate the achievement of course outcomes (CO's).
The process for finding the attainment of Course outcomes uses various tools/methods. These methods are classified into two types:

Assessment Methodology (Direct and Indirect)

Direct methods:

Direct methods display the student's knowledge and skills from their performance in the class assignment test (It is a metric used to continuously assess the student's understanding capabilities) , internal assessment tests [the Internal Assessment marks in a theory paper shall be based on two tests, sessional test(mid-1) & pre university test (PUT) mid-2], End semester examinations (theory or practical), seminars, laboratory assignments/experiments (it is a qualitative performance assessment tool designed to assess student's practical knowledge and problem solving skills), mini/major projects, add on courses, certification, presentations (as per the requirement) etc. These methods provide a sampling of what students know and/or can do and provide strong evidence of student learning.
Various methods used in assessment process that periodically documents and demonstrates the degree to which the Course Outcomes are attained.

Indirect methods:

Indirect methods such as course exit survey/assignments of course outcomes by feedback, assignments of mini/major project by external experts, faculty feedback, examiner feedback & others survey to reflect on student's learning. They are used to assess opinions or thoughts about the graduate's knowledge or skills.
Collect variety of information about course outcomes from the students after learning entire course.

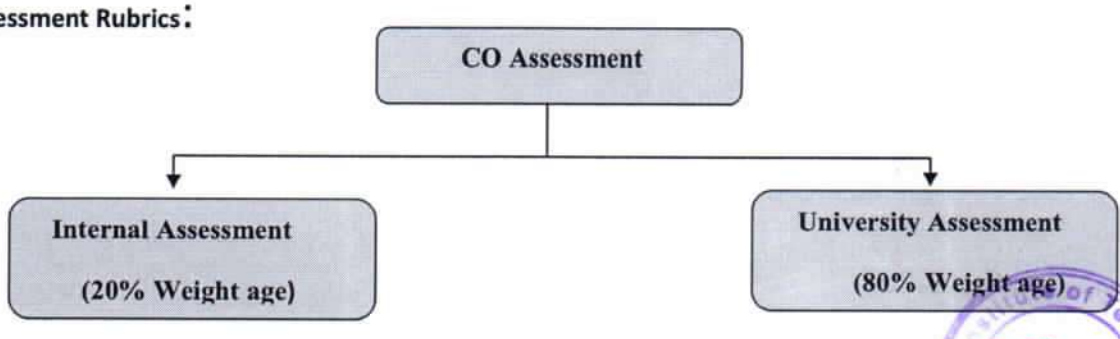
Rubrics are used for both formative and summative assessment of students. Same rubric is used for assessing an outcome so that the faculty is able to assess student progress and maintain the record of the same for each student.

ASSESSMENT PROCESS

Assessment Process for CO Attainment:

For the evaluation and assessment of CO's and PO's, rubrics are used. The rubrics considered here are given below:

CO Assessment Rubrics:



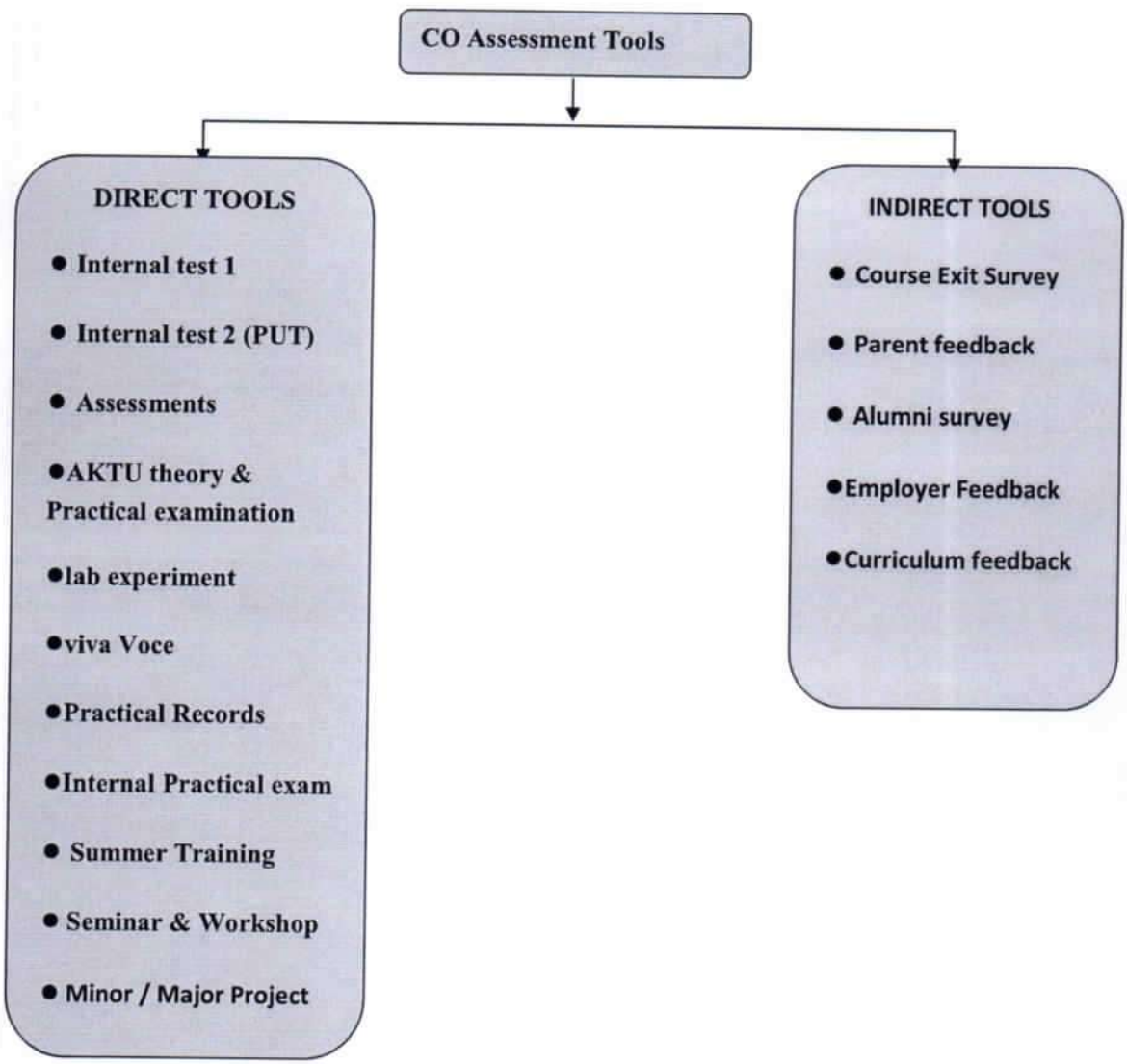
Assessment Type	Assessment method	weight age	Assessment Period	Assessment and Reviewed By
Direct	Assessment tool based on Subject nature	80% (80% of AKTU Examination + 20% of the Assessment tools)	Once per Semester	Department Advisory committee
	AKTU Examination		Once per Semester	
Indirect	Current Passing out Students Survey	20%	8th semester	Department Advisory committee
	Recruiters Survey		Every Placement activity	
	Alumni Survey		Once per Year	

Course Outcome is evaluated based on the performance of students in internal assessments and in university examination of a course. Internal assessment contributes 20% and university assessment contributes 80% to the total attainment of a CO.

CO Assessment Tools

The description of Assessment tools used for the evaluation of program outcomes is given in Table below. The various assessment tools used to evaluate COs and the frequency with which the assessment processes are carried out are listed in this table In each course, the level of attainment of each CO is compared with the predefined targets, if is not, the course coordinator takes necessary steps for the improvement to reach the target. With the help of CO against PO/PSO mapping, the PO/PSO attainment is calculated by program coordinator. Assessment Tools are of two types' direct tools and indirect tools. Which are described below?

Fig-9


CO Assessment Tools
DIRECT TOOLS
Internal test 1
Internal test 2 (PUT)
Assessments
AKTU theory & Practical examination
lab experiment
viva Voce
Practical Records
Internal Practical exam
Summer Training
Seminar & Workshop
Minor / Major Project
INDIRECT TOOLS
Course Exit Survey
Parent feedback
Alumni survey
Employer Feedback
Curriculum feedback

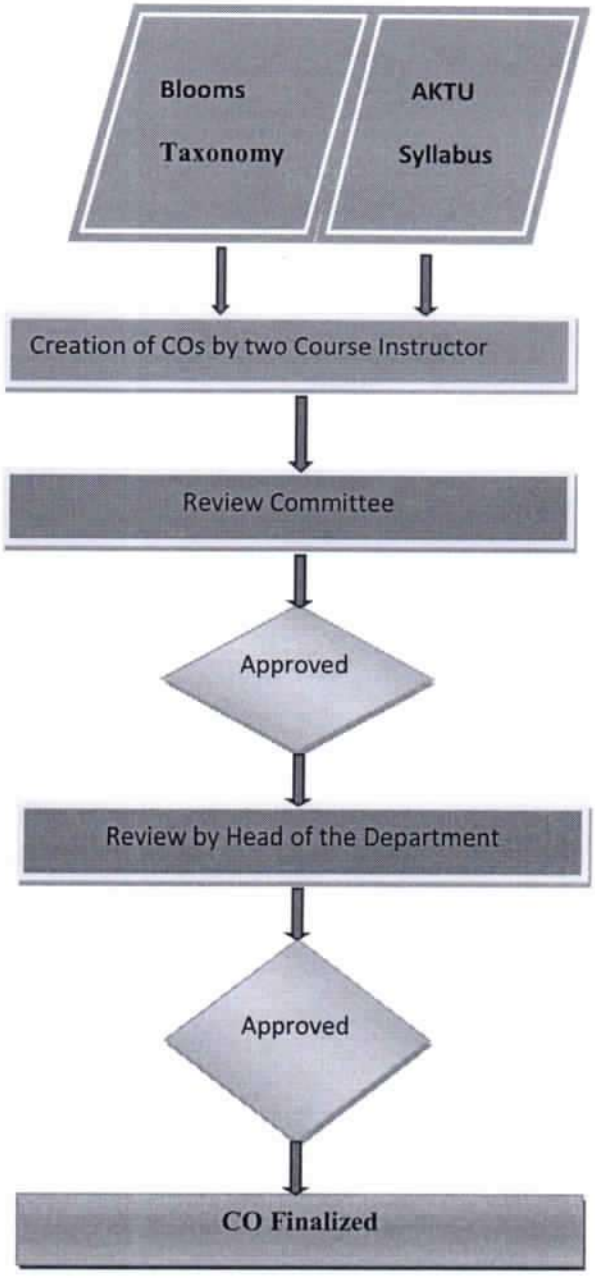
Assessment process

for calculating the attainment of POs and PSOs

Assessment Process for Evaluation of Course Outcomes:

Assessment tools and its frequency, the responsible authority to collect the data and its relevant COs, are tabulated as follows:

Fig.



Assessment Method & Attainment Level :

Step 1: Obtain Course Outcome.

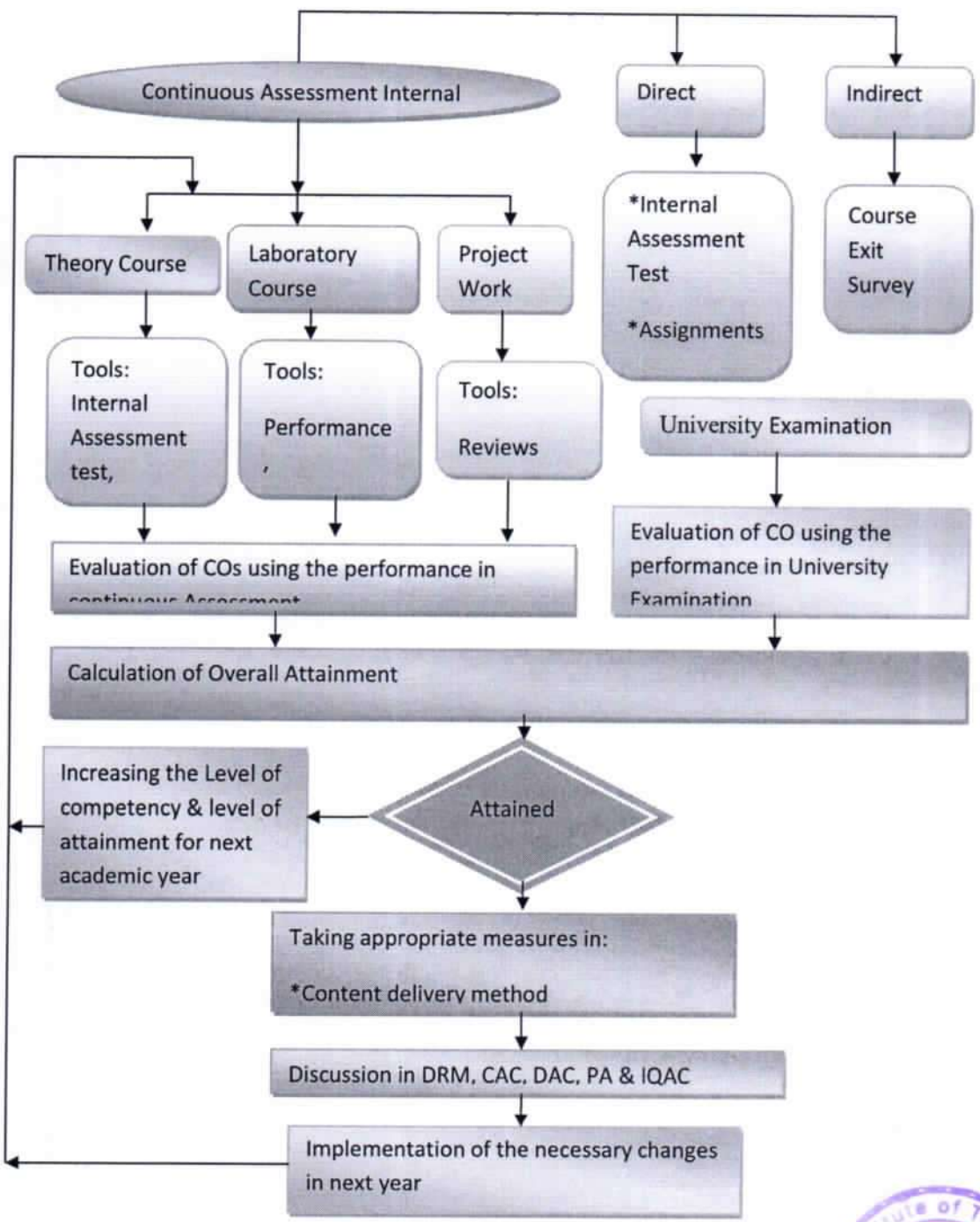
Step 2: Mapping of CO with PO.

Step 3: Setting weight- age for CO assessment.

Step 4: COs measurement through assessment.

Step 5: Obtain PO attainment table through direct and indirect method.

Process for CO Attainment: Fig. 10



Methodology for Evaluating Course Outcomes (COs) Internal

Concurrent Evaluation Criteria				
Pattern	**Nature of Course Full / Half Credit**	**Concurrent Evaluation**	**Nature of Exam/Assignments/Others**	**Converted Marks**
1. B. Tech Odd/Even (2021- 22) **2. MBA- Odd/Even (2021- 22)**	1- Generic Core Courses (Full credit) 2- Generic Elective courses (Half Credit)	**Internal Test 1(sessional)** & **Internal Test 2 (PUT)**	**Test 1 Marks- 40** (CO1 & CO2- 20 Mark each) **Test 2 (PUT) Marks - 60** (CO_3 ,CO4 & CO5 - 20 Marks each)	**Test 1**: CO1 & CO2 (Objective) = 20 (10 marks each) **Test 2** : CO3,CO4 & CO5 (Descriptive) = 30 (10 marks each)
		Assignments (Unit wise)	Unit-1 Unit-2 Unit-3 Unit-4 Unit-5	25 (5 Marks Each)
		***Others**	Seminar/Presentation/Project (Mini/Major)/Viva/Quiz/Work shop etc.	25 (5 Marks Each)
			Total Marks (Each COs)-	100

Table: 2

*** Presentation / Case Study / Role Play/ Industrial Visit/Field Visit/ Seminar/Guest Lecture /MCQs/Research paper writing/ Viva etc.**

Methodology for Evaluating Course Outcomes (COs) External

COMPUTATION OF SGPA, YGPA & CGPA

The Dr. A.P.J. Abdul Kalam Technical University (APJAKTU), Lucknow adopts absolute grading system wherein the marks are converted to grades and every semester results will be declared with semester grade point average (SGPA). Yearly Grade Point Average (YGPA) shall be calculated at each year by calculating from the formula given in section 14.4 (b) of an academic year. The Cumulative Grade Point Average (CGPA) shall be calculated at the end of last semester of the program. The grading system is with the following letter grades and grade points scale as given below:

Score (Marks) Range	(AKTU Guidelines) Letter Grade	Level	Grade Points
≥ 90	A^+	Outstanding	10
<90	A	Excellent	9
<80 , ≥70	B^+	Very Good	8
<70 ,≥60	B	Good	7
<60 ,≥50	C	Above Average	6
<50 ,≥45	D	Average	5
<45 ,≥ 40	E	Poor	4
<40	F	Fail	00

KASHI INSTITUTE OF TECHNOLOGY, VARANASI

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CO Attainment for End Semester Examination (AKTU 80%)

Cource : B.Tech | **Semester: VI** | **Academic Year:2021-2022**

Course Code : KOE074 | **Course Name : Renewable Energy Resources**

Name of the Faculty : Dr. Ravirajan Kr. Singh

S.N.	University Roll No.	NAME OF STUDENT	Internal Marks (50)	External Marks (100)	Total Marks (150)	Percentage	Grade Point Obtained
			Marks Obtained	Marks Obtained			
1	1842881001	CHANDRAMANI PANDEY	44	44	88	58.66666667	C
2	1842881002	DHIRENDRA PRATAP	48	55	103	68.66666667	B
3	1842881003	MOHINI SINGH	49	71	120	80	A
4	1842881007	TEJU PRASAD	43	43	86	57.33333333	C
5	1904280519001	ANCHAL MAURYA	42	71	113	75.33333333	B+
6	1904280519002	PRAMOD KUMAR (ABS)	42	0	42	28	F
7	1904280519003	SHREYA PANDEY	42	49	91	60.66666667	B
		Total Number Of Studeat			7		
		Number of Studeats Secured More Than 50 % Marks			6		
		% of Students Attained			85.71428571		
		Attainment Level			3		

Rationale :

1- Since question wise students marks are not provided by affiliating university these marks are kept separate. If results are available with question wise marks COs wise analysis might have been done .

2- As we expect that each student must at least get 40% marks and he/ she may secure with pass percentage.

% of Marks Secured in a Subject / Course	Letter Grade (AKTU Guidelines)	LEVEL	Grade Points
≥ 90	A+	(Outstanding)	10
< 90	A	(Excellent)	9
< 80, ≥ 70	B+	(Very Good)	8
< 70, ≥ 60	B	(Good)	7
< 60, ≥ 50	C	(Above Average)	6
< 50, ≥ 45	D	(Average)	5
< 45, ≥ 40	E	(Poor)	4
< 40	F	(Fail)	0

Gap Analysis

Achieved Attainment %	Target Attainment %	Target in Level	Attainment Level	Gap = Target in level - Attainment in level
85.71428571	Target Attainment>= 50 %	3	3	0

Target / Threshold Level & Attainment Level

If 60% Students Scoring >=50% Marks	If 50% Students Scoring >=50% Marks	If 40% Students Scoring >=50% Marks
Attainment Level - 3 (H)	Attainment Level - 2 (M)	Attainment Level - 1 (L)

Action Taken Report

COs	Action Taken
CO1, CO2, CO3, CO4,CO5	Attained

Action taken for identified Gap (For Next Semester)

*Students are encouraged to Enrol NPTEL online certification course and to appear.
*Remedial Classes will be conducted.
*Bridge classes for units.
*Assignments for critical topic.
*Solution for university question for unit.

Sign of Faculty

Head
Department of EC/EN

Director

Direct Assessment of COs, POs & PSOs:

(Quality / Relevance of Assessment Process)

Assessment Process for Evaluation of Theory Courses

Assessment Tools and its frequency, the responsible authority to collect the data and its relevant COs, are tabulated in tables.

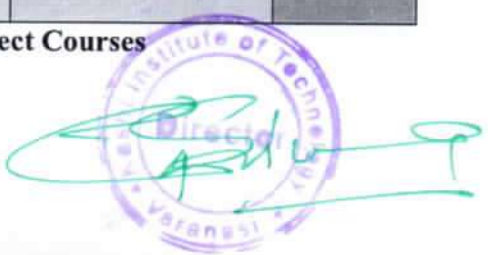
Assessment Tools	Assessment Period	Assessed By	Reviewed By	Mapping with COs
Class Test -1 Class Test -2 (Pre University Test) (PUT)	Once Per Semester	Course Instructor	Department Advisory committee (DAC)	Relevant CO
Assignments-1	Once Per Semester	Course Instructor	Department Advisory committee (DAC)	CO1
Assignments-2				CO2
Assignments-3				CO3
Assignments-4				CO4
Assignments-5				CO5
Quizzes	Once Per Semester	Course Instructor	Department Advisory committee (DAC)	All COs
University Semester Exam	Once Per Semester	Course Instructor	Department Advisory committee (DAC)	All COs

Assessment Tools	Assessment Period	Assessed By	Reviewed By	Mapping with COs
Lab Experiment	Throughout Semester	Course Instructor	Department Advisory committee (DAC)	All COs
Viva Voce	Throughout Semester	Course Instructor		All COs
Practical Record	Throughout Semester	Course Instructor		All COs
Internal Practical Exam	Once Per Semester	Internal Examiners		All COs
University Semester Exam	Once Per Semester	Internal Examiners appointed by the department & External Examiners Appointed by AKTU		All COs

Assessment Process for Evaluation of Laboratory Courses

Assessment Tools		Assessed Period	Assessed By	Reviewed By	Mapping with COs
Topic Approval		7th Sem	Project Review committee	Department Advisory committee (DAC)	All COs
Progress Presentation 1	Presentation Skill	7th Sem			All COs
	Viva Voce				
	Implementation report				
	Faculty Interaction				
Progress Presentation 2	Presentation Skill	7th Sem			All COs
	Viva Voce				
	Implementation report				
	Faculty Interaction				
Internal Final Presentation	Presentation Skill	8th Sem	Internal Examiners appointed by the department & External Examiners Appointed by AKTU		All COs
	Viva Voce				
	Implementation report				
	Faculty Interaction				
External Presentation	Presentation Skill	8th Sem			All COs
	Viva Voce				
	Implementation report				
	Faculty Interaction				

Assessment Process for Evaluation of Project Courses



Assessment Process for Evaluation of Seminar Courses & Industrial Training Courses

Assessment Tools		Assessed Period	Assessed By	Reviewed By	Mapping with COs
External Presentation	Presentation Skill Viva Voce Implementation report Faculty Interaction	Once Per Semester	Seminar Review committee	Department Advisory committee (DAC)	All COs

Assessment Process for General Proficiency Course

Assessment Tools	Assessed Period	Assessed By	Reviewed By	Mapping with COs
Sports Event	**Throughout the program**	**Sports Committee**	**Department Advisory Committee (DAC)**	**CO1**
Cultural Events		**Cultural Committee**		**CO2**
Technical Events		**Technical Committee**		**CO3**
Societal & Environmental Events		**Societal & Environmental Committee**		**CO4**
Discipline		**Proctorial Board**		**CO5**

CO Attainment Target Level Methods:

There can be several methods. e.g.

- Same target is identified for all the COs of the course i.e. target can be class average marks ≥ 60% marks.

- Target are same for all COs and are set in terms of performance level of different groups of students. While this method classifies students in to different categories, it does not provide any specific clues to plans for improvements of quality of learning. e.g.

Target			
(% of students getting< 50)	**(% of students getting >50 and < 65)**	**(% of students getting >65 and < 80**	**(% of students getting ≥ 80)**
10	**40**	**40**	**10**

- Targets are set for each CO of a course separately. It does not directly indicate the distribution of performance among the students. However, it has the advantage of finding out the difficulty of specific COs. Fig.

COs	Target (Class Average)
CO1	**70%**
CO2	**80%**
CO3	**75%**
CO4	**65%**
CO5	**80%**

Target Level :

- Targets are quantized in to certain level, 3 being the most common number of levels.
- Level 3: If 70% students scoring ≥ 60% of Marks allocated to CO
- Level 2: If 60% student scoring ≥ 60% of Marks in CO
- Level 1: If 50% student scoring ≥ 60% of Marks in CO
- Level 0: If < 50% student scoring ≥ 60% of Marks in CO

Aim is to attain Level 3

CO Attainment Calculation:

The course outcomes for all the courses are calculated in terms of percentage using the formula.

$$\textbf{CO}x \textbf{ in } \% = \frac{\text{Marks obtained by the students in CO}x}{\text{Maxium marks alloted in CO}x} \times 100$$

Where x = [1 to N], N= Number of COs

Each course outcome is calculated for all the students based on marks obtained by the students.

$$\textbf{CO}x \textbf{ Attainment in } \% = \left[\frac{\text{No. of Students scored } \geq 70 \text{ of Marks in CO}x}{\text{Total No. of students}} \times 100\right]$$

Where x = [1 to N], N= Number of Cox

CO Attainment Level is defined based on the following criteria:

Fig.

Assessment Method	COs Attainment Level	
Internal Assessment	Level 3	If 70% students scoring ≥ 70% of Marks in COs
	Level 2	If 60% student scoring ≥ 70% of Marks in COs
	Level 1	If 50% student scoring ≥ 70% of Marks in COs

After calculating the attainment level of each COs from the performance of Internal Assessment Test 1 & 2, the attainment level of Internal Assessment Test is calculated with ratio of sum of all

the COs attained by total number of COs as shown below:

$$\textbf{IAT Attainment Level} = \frac{\text{Sum of all COs attained by students}}{\text{Total Number of COs}}$$

Where IAT = Internal Assessment Test

IAT is calculated as follows:

$$\text{E.g. Internal Assessment Test} = \frac{CO1+CO2+CO3+CO4+}{5}$$

Based on university grade, the attainment level of COs is calculated. The attainment level is decided on the following criteria.

Fig.

	Assessment Method	Cox Attainment Level	
	University (External) Assessment	Level 3	If 60% student scoring ≥ 50% of Marks in University Exam
		Level 2	If 50% student scoring ≥ 50% of Marks in University Exam
		Level 1	If 40% student scoring ≥ 50% of Marks in University Exam

The university attainment level is calculated as follows

$$\text{Over all CO Attainment } \boldsymbol{Direct} = \left(\frac{\sum_{i=1}^{n} COi}{n} \times 0.2\right) + (UA \times 0.8)$$

(Where n = Number of course outcome)

$$\textbf{Over all Attainment} = \frac{(DTA + UA) + IDA}{2}$$

(Where UA = University Attainment level)

(DTA= Direct Attainment level, IDA = Indirect attainment Level)

CO ATTAINMENT: SAMPLE (RES)

KASHI INSTITUTE OF TECHNOLOGY,VARANASI

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES ATTAINMENTS BASED ON DIRECT ASSESSMENT TOOLS (INTERNAL 20%)

INTERNAL TEST (IT), ASSIGNMENTS (A) & OTHER (O) (QUIZ / SEMINAR / PROJECT/ LAB EXP./WORKSHOP) MARKS

Cource : B.Tech
Course Code : KOE074
Name of the Faculty : Dr. Raviranjan Kr. Singh

Semester: VI

Academic Year:2021-2022
Course Name : Renewable Energy Resources

S.N.	Roll No.	TEST-1 (OBJECTIVE)						TEST-2 (DESCRIPTIVE)																					
		CO1			CO2			CO3				CO4				CO5				TOTAL CO1	% CO1	TOTAL CO2	% CO2	TOTAL CO3	% CO3	TOTAL CO4	% CO4	TOTAL COS	% COS
		IT	A	O	IT	A	O	Original Marks	PUT	A	O	Original Marks	PUT	A	O	Original Marks	PUT	A	O										
		10	5	5	10	5	5		10	5	5		10	5	5		10	5	5	20		20		20		20		20	
1	1842831001	8	4	4	8	4	4	12	6	4	4	12	6	4	5	16	8	4	4	16	80	16	80	14	70	15	75	16	80
2	1842831002	9	5	4	10	5	5	16	8	4	5	14	7	5	4	16	8	4	4	18	90	20	100	17	85	16	80	16	80
3	1842831003	10	5	4	10	5	5	16	8	5	5	16	8	5	4	12	6	5	4	19	95	20	100	18	90	17	85	15	75
4	1842831007	7	4	4	8	4	4	8	4	4	4	12	6	4	4	10	5	3	4	15	75	16	80	12	60	14	70	14	70
5	1904280319001	8	4	5	8	4	4	10	5	4	5	12	6	3	5	10	5	5	4	17	85	16	80	14	70	14	70	14	70
6	1904280319002	6	3	4	6	4	3	12	6	3	3	8	4	3	3	8	3	3	2	13	65	13	65	12	60	10	50	8	40
7	1904280319003	8	4	5	8	5	4	12	6	4	5	12	6	3	5	10	5	3	4	17	85	17	85	15	75	14	70	12	60
																				Total number of Students		7		7		7		7	
																				Number of Student Secured >= 70% Marks		6		6		5		6	
																				% of Students Attained		86		86		71		86	
																				Attainment Level		3		3		3		3	

If 70% Students Scoring >=70% Marks
ATTAINMENT LEVEL 3
If 60% Students Scoring >=70% Marks
ATTAINMENT LEVEL 2
If 50% Students Scoring >=70% Marks
ATTAINMENT LEVEL 1

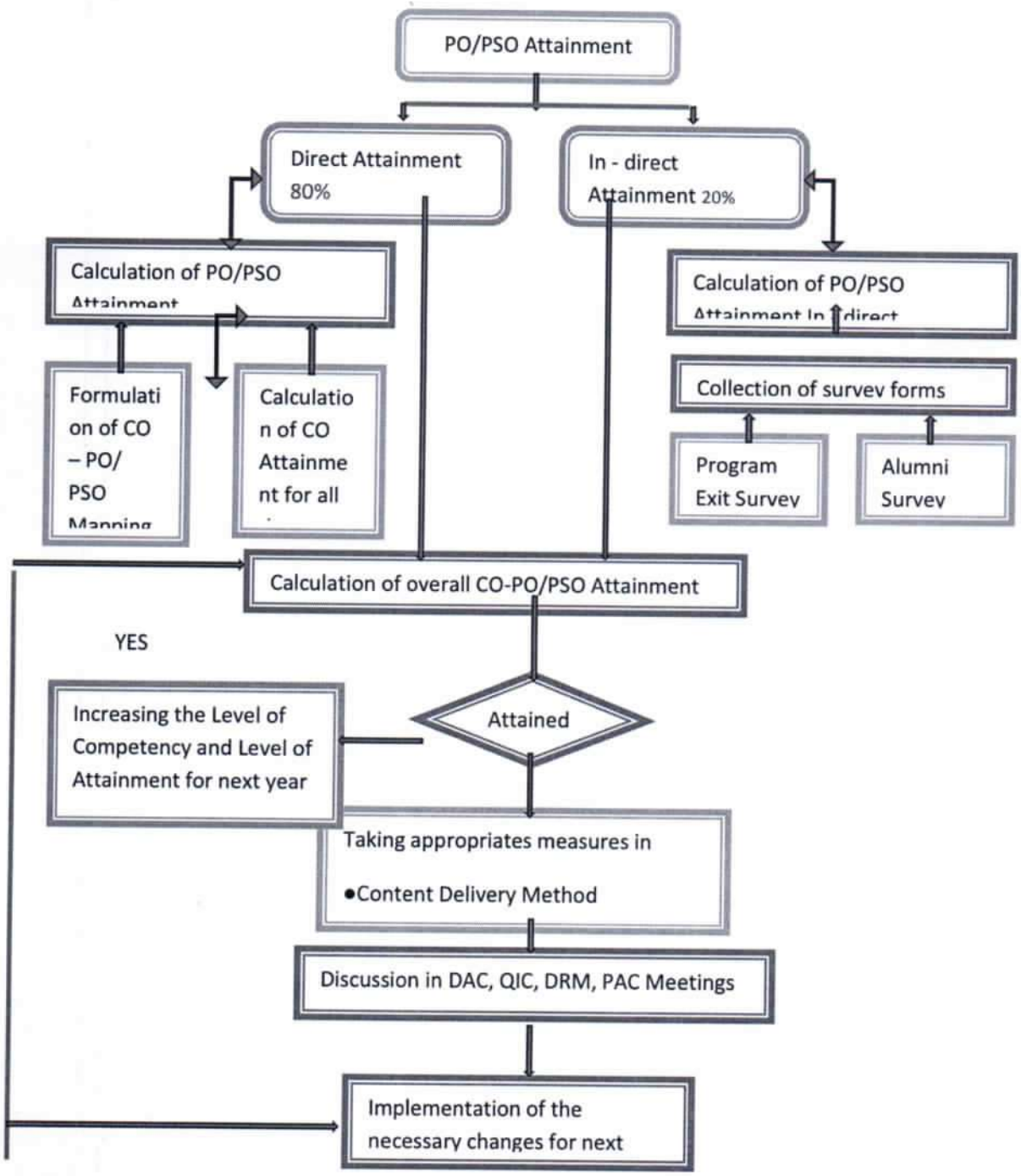
CO Attainments

S.N.	COs NO.	ATM Level	CO Attainments %
1	CO1	3	85.71
2	CO2	3	85.71
3	CO3	3	71.43
4	CO4	3	85.71
5	CO5	3	71.43
AVG		3.00	80.00

Signature of faculty

Head
Department of EC/EN

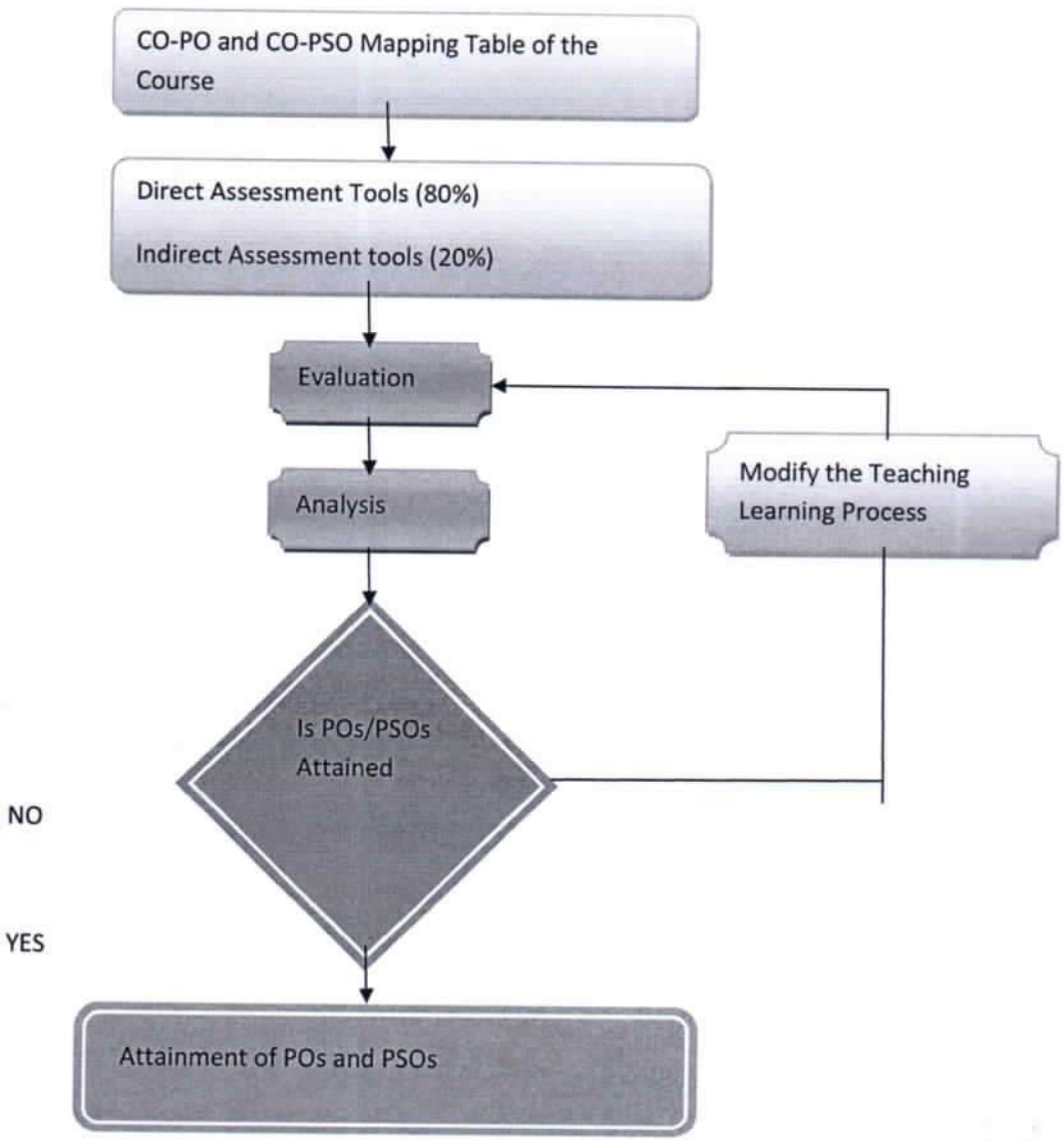
Process for PO/PSO Attainment: Fig: 1



Assessment tools and processes used for measuring the Attainment of each of the Program Outcomes (POs) and Program Specific Outcomes (PSOs):

Evaluation of attainment of POs and PSOs is based on direct and indirect assessment tools. Direct assessment of POs and PSOs is based on student's performance in continuous assessment and university examination. Indirect assessment is based on Program Exit Survey (Theory & Practical). The various direct and indirect tools and its frequency, the responsible authority to collect data for assessing the attainment of each POs and PSOs are given below table.

Fig.



Course level PO & PSO Attainment Calculation:

The PO & PSO attainment for the course is calculated using following formula

PO Attainment of Course (X)

= CO Attainment % of Course (X) × PO*y mapping value of course(x)/100*

PO Attainment Level of Course (X)

= (weighted Average Value of PO × CO Attainment Average) / **3**

PSO Attainment of Course (X)

= CO Attainment % of Course (X) × PSO*y mapping value of course(x)/100*

(Where, y = [1 to N], N= Number of Program Outcomes

PSO Attainment Level of Course (X)

= (weighted Average Value of PSO × CO Attainment Average) / **3**

(Where, y = [1 to N], N= Number of Program Specific Outcomes)

PO & PSO ATTAINMENT

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech Semester: IV Academic Year:2021-2022
Course Code : KEE 401 Course Name : Digital Electronics.

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2
CO3	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2
CO4	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2
CO5	3	2	1	2	2	-	-	-	-	-	-	2	2	3	2

CO- PO & PSO COMPUTATION

		PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
COs	CO Attainment %	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	75.00	2	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.75	-	-
CO2	100.00	3	3	2	2	1	1	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	2	2
CO3	25.00	3	0.8	2	0.5	1	0.3	2	0.5	2	0.5	-	-	-	-	-	-	-	-	-	-	-	-	2	0.5	2	0.5	3	0.75	2	0.5
CO4	25.00	3	0.8	2	0.5	1	0.3	2	0.5	2	0.5	-	-	-	-	-	-	-	-	-	-	-	-	2	0.5	2	0.5	3	0.75	2	0.5
CO5	12.50	3	0.4	2	0.25	1	0.1	2	0.25	2	0.25	-	-	-	-	-	-	-	-	-	-	-	-	2	0.25	2	0.25	3	0.38	2	0.25
TOTAL		14	6.4	8	3.25	4	1.6	8	3.25	8	3.25	-	-	-	-	-	-	-	-	-	-	-	-	8	3.25	8	3.25	13	5.63	8	3.25
Attainment %			46		40.6		41		40.6		40.6		#####		#####		#####		#####		###		#####		40.6		40.6		43.3		40.6
Attained Level			2		2		2		2		2		#####		#####		#####		#####		###		#####		2		2		2		2
WEIGHTED AVERAGE VALUE OF POs/PSOs			1.28		0.81		0.41		0.81		0.81	-	-	-	-	-	-	-	-	-	-	-	-		0.81		0.81		1.13		0.81

P = PLANNED A = ATTAINED

CO Attainments			
S.N.	COs NO.	CO Percentage	CO ATM Level
1	CO1	75.00	3
2	CO2	100.00	3
3	CO3	25.00	1
4	CO4	25.00	1
5	CO5	12.50	1

Action Taken Report	
COs	Action Taken
CO1	Attained
CO2	Attained
CO3	Attained
CO4	Attained
CO5	Attained

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech Semester: IV Academic Year:2021-2022
Course Code : KEE 401 Course Name : Electrical Machine-I

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO1	PSO1	PSO2	PSO3
CO1	2	---	---	---	---	---	---	---	---	---	---	---	---	1	---
CO2	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2
CO3	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2
CO4	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2
CO5	3	2	1	2	2	---	---	---	---	---	---	2	2	3	2

CO- PO & PSO COMPUTATION

		PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
COs	CO Attainment %	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	75.00	2	1.5	---	---	---	---	---	---	---	---	---	---	---	---	-	---	---	---	---	---	---	---	---	---	---	---	1	0.75	---	---
CO2	100.00	3	3	2	2	1	1	2	2	2	2	---	---	---	---	---	---	---	---	---	---	---	---	2	2	2	2	3	3	2	2
CO3	0.00	3	---	2	---	1	---	2	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	2	---	3	---	2	---
CO4	0.00	3	---	2	---	1	---	2	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	2	---	2	---	3	---	2	---
CO5	12.50	3	0.38	2	0.25	1	0.125	2	0.25	2	0.25	---	---	---	---	---	---	---	---	---	---	---	---	2	0.1	2	0.25	3	0.375	2	0.25
TOTAL		14	4.88	8	2.25	4	1.125	8	2.25	8	2.25	---	---	---	---	---	---	---	---	---	---	---	---	8	2.1	8	2.25	13	4.125	8	2.25
Attainment %			34.8		28.1		28.13		28.13		28.13		#####		###		#####		###		#####		###		28		28.13		31.73		28.13
Attained Level			2		2		2		2		2		#####		###		#####		###		#####		###		2		2		2		2
WEIGHTED AVERAGE VALUE OF			1.63		1.13		0.56		1.13		1.13		---		---		---		---		---		---		1.13		1.13		1.38		1.13

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech | Semester: VIII | Academic Year: 2021-2022
Course Code : KDE084 | Course Name : Introduction to Smart Grid

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	3	1	1	-	2	2	2	1	2	1	1	3
CO2	2	1	2	2	2	1	2	2	2	2	2	3	1	1	3
CO3	2	2	2	2	2	1	-	1	2	2	3	2	2	1	2
CO4	-	2	2	1	2	1	-	1	2	2	3	2	1	1	2
CO5	-	1	2	1	-	1	2	1	2	2	2	2	1	1	2

CO- PO & PSO COMPUTATION

COs	CO Attainment %	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	42.86	2	0.857	1	0.425	2	0.86	3	1.286	1	0.43	1	0.43	-	-	2	0.86	2	0.86	2	0.86	1	0.43	2	0.9	1	0.43	1	0.43	3	1.286
CO2	100.00	2	2	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	3	3	1	1	1	1	3	3
CO3	71.43	2	1.429	2	1.429	2	1.43	2	1.429	2	1.43	1	0.71	-	-	1	0.71	2	1.43	2	1.43	3	2.14	2	1.4	2	1.43	1	0.71	2	1.429
CO4	57.14	-	-	2	1.143	2	1.14	1	0.571	2	1.14	1	0.57	-	-	1	0.57	2	1.14	2	1.14	3	1.71	2	1.1	1	0.57	1	0.57	2	1.143
CO5	71.43	-	-	1	0.714	2	1.43	1	0.714	-	-	1	0.71	2	1.429	1	0.71	2	1.43	2	1.43	2	1.43	2	1.4	1	0.71	1	0.71	2	1.429
TOTAL		6	4.286	7	4.714	10	6.86	9	6	7	5	5	3.43	4	1.429	7	4.86	10	6.86	10	6.86	11	7.71	11	7.9	6	4.14	5	3.43	12	8.286
Attainment %			71.43		67.35		68.6		66.67		71.4		68.6		85.71		69.4		68.6		68.6		70.1		71		69		68.6		69.05
Attained Level			3		2		3		2		3		2		3		2		2		2		3		3		2		2		2
WEIGHTED AVERAGE VALUE OF POs/PSOs			1.43		0.94		1.37		1.20		1.25		0.69		1.71		0.97		1.37		1.37		1.54		1.57		0.83		0.69		1.66

P = PLANNED | A = ATTAINED

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech | Semester: VI | Academic Year:2021-2022
Course Code : KEC 063 | Course Name : DCN

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	2	-	-	-	-	-	-	-	-	3	1	0
CO2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1
CO3	2	1	2	0	-	-	-	-	-	-	-	-	1	-	-
CO4	2	1	1	0	-	-	-	-	-	-	-	-	-	1	-
CO5	2	1	1	0	-	-	-	-	-	-	-	-	-	1	-

CO- PO & PSO COMPUTATION

COs	O Attainment %	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	76.67	2	1.53	1	0.77	2	1.53	2	1.53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2.3	1	0.767	-	-
CO2	83.33	2	1.67	1	0.83	3	2.5	1	0.83	1	0.8	1	0.8	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	3	2.5	1	0.833	1	0.833
CO3	80.00	2	1.6	1	0.8	2	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.8	-	-	-	-
CO4	70.83	2	1.42	1	0.71	1	0.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.708	-	-
CO5	67.50	2	1.35	1	0.68	1	0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.675	-	-
TOTAL		10	7.57	5	3.78	9	7.02	3	2.37	1	0.8	1	0.8	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	7	5.6	4	2.983	1	0.833
Attainment %			75.7		75.7		78		78.9		83		83		83.3		83.3		83.3		83.3		83.3		83.3		80		74.58		83.33
Attained Level			3		3		3		3		3		3		3		3		3		3		3		3		3		3		3
WEIGHTED AVERAGE VALUE			1.51		0.76		1.40		1.18		0.83		###		0.83		0.83		0.83		0.83		0.83		0.83		1.87		0.75		0.83

P = PLANNED | A = ATTAINED

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech | Semester: V | Academic Year:2021-2022
Course Code : KEC 607 | Course Name : EMI
Name of the Faculty : | Section : A

CO-PO & PSO MAPPING

		PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	2	-	-	-	-	-	-	-	-	3	1	-
CO2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1
CO3	2	1	2	-	-	-	-	-	-	-	-	-	1	-	-
CO4	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-
CO5	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-

CO- PO & PSO COMPUTATION

COs	CO Attainment %	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	79.17	2	1.6	1	0.8	2	1.58	2	1.58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2.38	1	0.792	-	-
CO2	83.33	2	1.7	1	0.8	3	2.5	1	0.83	1	0.8	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	3	2.5	1	0.833	1	0.83
CO3	81.67	2	1.6	1	0.8	2	1.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.82	-	-	-	-
CO4	79.17	2	1.6	1	0.8	1	0.79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.792	-	-
CO5	75.83	2	1.5	1	0.8	1	0.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.758	-	-
TOTAL		10	8	5	4	9	7.27	3	2.42	1	0.8	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	7	5.69	4	3.175	1	0.83
Attainment %			80		80		80.7		80.6		83		83.3		83.3		83.3		83.3		83.3		83.3		83.3		81.3		79.38		83.3
Attained Level			3		3		3		3		3		3		3		3		3		3		3		3		3		3		3
WEIGHTED AVERAGE VALUE OF POs/PSOs			###		0.80		1.45		1.21		0.83		0.83		0.83		0.83		0.83		0.83		0.83		0.83		1.90		0.79		0.83

P = PLANNED | A = ATTAINED

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech | Semester: | Academic Year:2021-2022
Course Code : KEC 602 | Course Name : MPMC
Name of the Faculty : | Section : A

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	2	-	-	-	-	-	-	-	-	3	1	-
CO2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1
CO3	2	1	2	-	-	-	-	-	-	-	-	-	1	-	-
CO4	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-
CO5	2	1	1	-	-	-	-	-	-	-	-	-	-	1	-

CO- PO & PSO COMPUTATION

COs	O Attainment %	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
		P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	79.17	2	1.58	1	0.792	2	1.6	2	1.58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2.38	1	0.79	-	-
CO2	83.33	2	1.67	1	0.833	3	2.5	1	0.83	1	0.8	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.8	1	0.83	3	2.5	1	0.83	1	0.833
CO3	73.33	2	1.47	1	0.733	2	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.73	-	-	-	-
CO4	70.83	2	1.42	1	0.708	1	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.71	-	-
CO5	67.50	2	1.35	1	0.675	1	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.68	-	-
TOTAL		10	7.48	5	3.742	9	6.9	3	2.42	1	0.8	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.83	1	0.8	1	0.83	7	5.61	4	3.01	1	0.833
Attainment %			74.8		74.83		77		80.6		83		83.3		83.3		83.3		83.3		83.3		83		83.3		80.1		75.2		83.33
Attained Level			3		3		3		3		3		3		3		3		3		3		3		3		3		3		3
WEIGHTED AVERAGE VALUE			1.50		0.75		###		1.21		0.83		0.83		0.83		0.83		0.83		0.83		0.83		0.83		1.87		0.75		0.83

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech Semester: VIII Academic
Year: 2021-2022
Course Code : KHU 802

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	3	1	1	-	2	2	2	1	2	1	1	1
CO2	2	1	2	2	2	1	2	2	2	2	2	3	1	1	1
CO3	2	2	2	2	2	1	-	1	2	2	3	2	2	1	2
CO4	-	2	2	1	2	1	-	1	2	2	3	2	1	1	2
CO5	-	1	2	1	-	1	2	1	2	2	2	2	1	1	2

CO- PO & PSO COMPUTATION

		PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
COs	CO Attainment %	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	85.71	2	1.71	1	0.86	2	1.71	3	2.6	1	0.86	1	0.86	-	-	2	1.71	2	1.71	2	1.7	1	0.86	2	1.71	1	0.86	1	0.86	3	2.57
CO2	85.71	2	1.71	1	0.86	2	1.71	2	1.7	2	1.71	1	0.86	2	1.714	2	1.71	2	1.71	2	1.7	2	1.71	3	2.57	1	0.86	1	0.86	3	2.57
CO3	28.57	2	0.57	2	0.57	2	0.57	2	0.6	2	0.57	1	0.29	-	-	1	0.29	2	0.57	2	0.6	3	0.86	2	0.57	2	0.57	1	0.29	2	0.57
CO4	0.00	-	-	2	-	2	-	1	-	2	-	1	-	-	-	1	-	2	-	2	-	3	-	2	-	1	-	1	-	2	-
CO5	0.00	-	-	1	-	2	-	1	-	-	-	1	-	2	-	1	-	2	-	2	-	2	-	2	-	1	-	1	-	2	-
TOTAL		6	4	7	2.29	10	4	9	4.9	7	3.14	5	2	4	1.714	7	3.71	10	4	10	4	11	3.43	11	4.86	6	2.29	5	2	12	5.71
Attainment %			66.7		32.7		40		54		44.9		40		42.86		53.1		40		40		31.2		44.2		38.1		40		47.6
Attained Level			2		2		2		2		2		2		2		2		2		2		2		2		2		2		2
WEIGHTED AVERAGE VALUE OF POs/PSOs			1.33		0.76		1.33		1.62		1.05		0.67		1.71		1.24		1.33		1.33		1.14		1.62		0.76		0.67		1.90

P = PLANNED A = ATTAINED

KASHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech Semester: III Academic Year:2021-2022
Course Code : KTC 303 Course Name : NAS

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	3	1	-	-	-	1	-	-	-	3	-	2
CO2	2	2	2	2	1	1	1	-	1	-	-	1	3	-	1
CO3	3	1	2	2	-	-	0	-	-	-	-	-	2	-	-
CO4	2	2	2	1	-	-	0	-	-	-	-	-	2	-	-
CO5	2	1	2	1	-	1	1	-	-	-	-	-	1	-	-

CO- PO & PSO COMPUTATION

		PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
COs	O Attainment %	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	82.50	3	2.48	2	1.65	2	1.7	3	2.5	1	0.83	-	-	-	-	-	-	1	0.83	-	-	-	-	-	-	3	2.48	-	-	2	1.65
CO2	81.25	2	1.63	2	1.63	2	1.6	2	1.6	1	0.81	1	0.8125	1	0.81	-	-	1	0.81	-	-	-	-	1	0.81	3	2.44	-	-	1	0.81
CO3	48.13	3	1.44	1	0.48	2	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.96	-	-	-	-
CO4	60.63	2	1.21	2	1.21	2	1.2	1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1.21	-	-	-	-
CO5	75.00	2	1.5	1	0.75	2	1.5	1	0.8	-	-	1	0.75	1	0.75	-	-	-	-	-	-	-	-	-	-	1	0.75	-	-	-	-
TOTAL		12	8.26	8	5.72	10	7	9	6.4	2	1.64	2	1.5625	2	1.56	-	-	2	1.64	-	-	-	-	1	0.81	11	7.84	-	-	3	2.46
Attainment %			68.8		71.5		70		71		81.9		78.125		78.1		-		81.9		-		-		81.3		71.3		-		82.1
Attained Level			2		3		2		3		3		3		3		-		3		-		-		3		3		-		3
WEIGHTED AVERAGE VALUE			1.65		1.14		1.39		1.28		0.82		0.78		0.78		-		0.82		-		-		0.81		1.57		-		1.23

P = PLANNED A = ATTAINED

KASHI INSTITUTE OF TECHNOLOGY,VARANASI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CO-PO ATTAINMENT

Course : B.Tech Semester: III
Academic Year:2021-2022
Course Code : KVE301
Course Name : Universal Human Values & Professional Ethics

CO-PO & PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	1	3	2	2	2	3	2	3	2	-
CO2	-	-	-	-	1	1	3	2	2	2	3	1	3	2	-
CO3	-	-	-	-	1	1	3	2	2	2	3	2	3	-	-
CO4	-	-	-	-	2	1	3	2	2	2	3	1	1	2	-
CO5	-	-	-	-	-	1	3	2	2	2	3	2	1	2	-

CO- PO & PSO COMPUTATION

		PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PSO1		PSO2		PSO3	
COs	CO Attainment %	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
CO1	77.78	-	-	-	-	-	-	-	-	2	1.56	1	0.78	3	2.33	2	1.56	2	1.56	2	1.6	3	2.33	2	1.556	3	2.33	2	1.556	-	-
CO2	0.00	-	-	-	-	-	-	-	-	1	0	1	0	3	0	2	0	2	0	2	0	3	0	1	0	3	0	2	0	-	-
CO3	44.44	-	-	-	-	-	-	-	-	1	0.44	1	0.44	3	1.33	2	0.89	2	0.89	2	0.9	3	1.33	2	0.889	3	1.33	-	0	-	-
CO4	55.56	-	-	-	-	-	-	-	-	2	1.11	1	0.56	3	1.67	2	1.11	2	1.11	2	1.1	3	1.67	1	0.556	1	0.56	2	1.111	-	-
CO5	44.44	-	-	-	-	-	-	-	-	-	0	1	0.44	3	1.33	2	0.89	2	0.89	2	0.9	3	1.33	2	0.889	1	0.44	2	0.889	-	-
TOTAL		-	-	-	-	-	-	-	-	6	3.11	5	2.22	#	6.67	10	4.44	10	4.44	10	4.4	15	6.67	8	3.889	11	4.67	8	3.556	-	-
Attainment %			-		-		-		-		51.9		44.4		44.4		44.4		44		44.4		48.61		42.4		44.44				-
Attained Level			-		-		-		-		2		2		2		2		2		2		2		2		2				-
WEIGHTED AVERAGE VALUE OF POs/PSOs			###		####		###		####		0.62		0.44		1.33		0.89		0.89		0.89		1.33		0.78		0.93		0.71		###

P = PLANNED A = ATTAINED

CO Attainments			
S.N.	COs NO.	CO Percentage	CO ATM Level
1	CO1	77.78	3
2	CO2	0.00	0.00
3	CO3	44.44	1
4	CO4	55.56	2
5	CO5	44.44	1

Action Taken Report	
COs	Action Taken
CO1	Attained
CO2	Attained
CO3	Attained
CO4	Attained
CO5	Attained

Signature of faculty

Head
Department of EC/EN

INDIRECT ATTAINMENT

KASHI INSTITUTE OF TECHNOLOGY, VARANASI

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INDIRECT ATTAINMENT

Cource : B.Tech | Semester: VI | Academic Year:2021-2022
Course Code:KOE074 | Course Name : Renewable Energy Resources
Name of the Faculty : Dr. Raviranjan Kr. Singh | Section : A

S.No	Roll No.	Name	MM (20)	Percentage
1	1842831001	CHANDRAMANI PANDEY	17	85
2	1842831002	DHIRENDRA PRATAP	19	95
3	1842831003	MOHINI SINGH	20	100
4	1842831007	TEJU PRASAD	16	80
5	1904280319001	ANCHAL MAURYA	17	85
6	1904280319002	PRAMOD KUMAR (ABS)	16	80
7	1904280319003	SHREYA PANDEY	18	90
		Total number of Students		7
		Number of Student Secured >= 70% Marks		7
		% of Students Attained		100
		Attainment Level		3

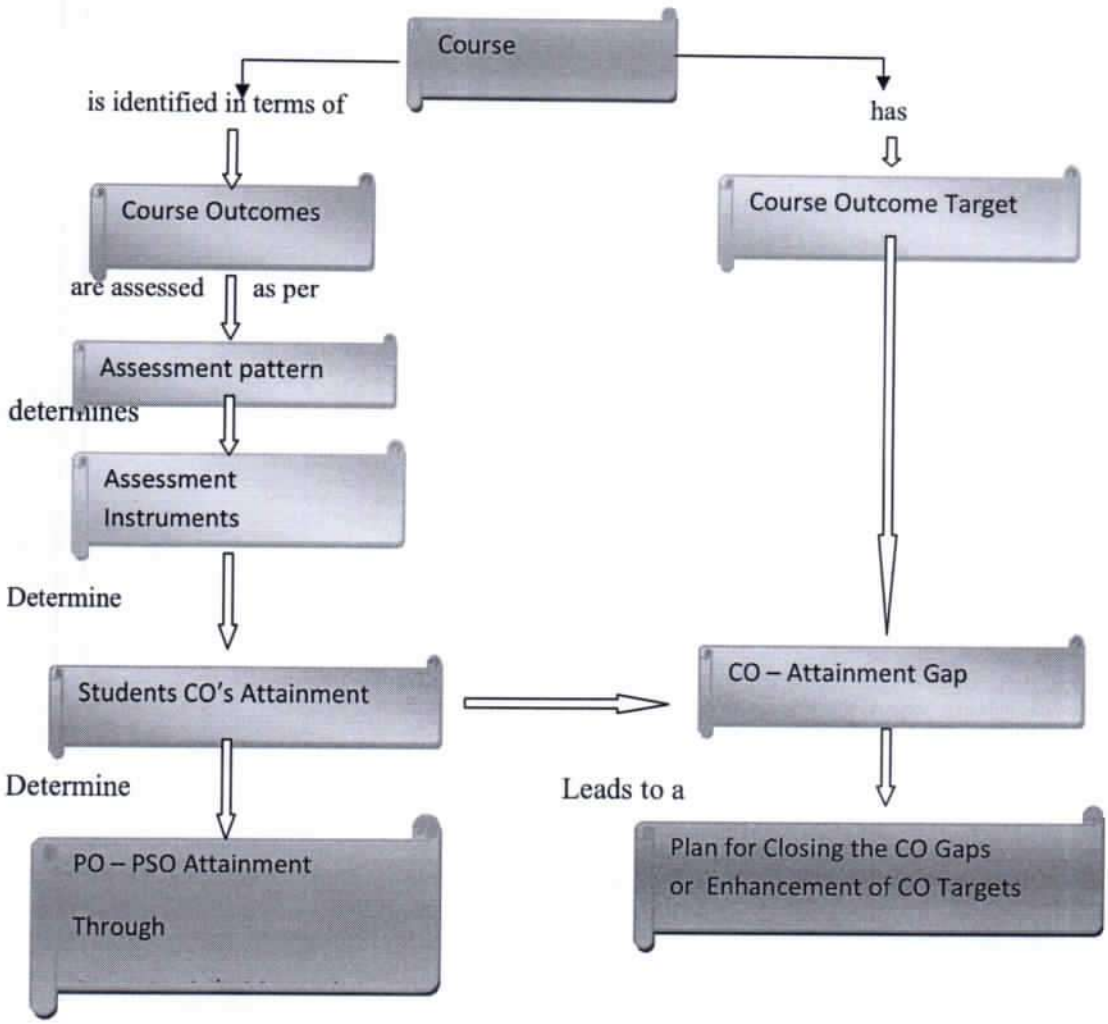
If 70% Students Scoring >= 70% Marks
ATTAINMENT LEVEL 3
If 60% Students Scoring >= 70% Marks
ATTAINMENT LEVEL 2
If 50% Students Scoring >= 70% Marks
ATTAINMENT LEVEL 1

Action Taken Report	
COs	**Action Taken**
CO1, CO2, CO3, CO4,CO5	Attained

Signature of faculty

Head
Department of EC/EN

CO attainment and Gap Analysis:



Calculation of Gap Analysis:

Gap = Target in level - Attainment in level

KASHI INSTITUTE OF TECHNOLOGY, VARANASI

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

OVERALL ATTAINMENT

Cource : B.Tech | Semester: VI | Academic Year:2021-2022
Course Code:KOE074 | Course Name : Renewable Energy Resources
Name of the Faculty : Dr. Raviranjan Kr. Singh | Section : A

DIRECT ATM LEVEL	AKTU END SEM ATM LEVEL	DT*0.2+AE*0.8	Indirect ATM Level	OVERALL ATM LEVEL
3.00	3	3.00	3	3.00
OVERALL ATM AVG.	3.00			

Gap Analysis

Target Attainment level	Attainment Level	Gap = Target in level - Attainment in level
3.00	3.00	0.00

Action taken after identifying the gaps:

Convey the identified gaps to Board of Studies:

Considering the feedback from faculty, PAC committee, students and DAB committee, a representation is prepared by the department to convey the gaps and possible action plan to the Board of Studies (BOS. These inputs are taken into consideration by BOS while revising the syllabus

Following activities are planned to fulfil the identified gap.

Action taken for identified Gap
*Students are encouraged to Enrol NPTEL online certification course and to appear for certification exam.
*Remedial Classes will be conducted.
*Bridge classes for units.
*Assignments for critical topic.
*Solution for university question for unit.