Hindustan College of Science and Technology

Department of First Year

COURSE OUTCOMES
(SESSION 2021-22)

B.Tech. I Semester

(All branches except Bio Technology

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS101T/ KAS102T	Engineering Physics/ Engineering Chemistry	3	1	0	30	20	50		100		150	4
2	KAS103T	Engineering Mathematics-II	3	1	0	30	20	50		100		150	4
3	KEE101T/ KEC101T	Basic Electrical Engineering/ Emerging Domain in Electronics Engineering	3	0	0	30	20	50		100		150	3
4	KCS101T/ KME101T	Programming for Problem Solving / Fundamentals of Mechanical Engineering & Mechatronics	3	0	0	30	20	50		100		150	3
5	KAS151P/ KAS152P	Engineering Physics Lab/ Engineering Chemistry Lab	0	0	2				25		25	50	1
6	KEE151P/ KEC151P	Basic Electrical Engineering Lab/ Electronics Engineering Lab	0	0	2				25		25	50	1
7	KCS151P/ KAS154P	Programming for Problem Solving / English Language Lab	0	1	2				25		25	50	1
8	KCE151P/ KWS151P	Engineering Graphics & Design Lab/ Mechanical Workshop Lab	0	1	2				50		50	100	1
9	KMC101/ KMC102	AI For Engineering/ Emerging Technology for Engineering	2	0	0	15	10	25		25		50	2
10	KNC201	Soft Skill II	2	0	0	15	10	25		25			
	MOOCs	(For B.Tech. Hons. Degree) *											
		Total										900	20

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B.Tech. II Semester

(All branches except Bio Technology

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS201T/ KAS202T	Engineering Physics/ Engineering Chemistry	3	1	0	30	20	50		100		150	4
2	KAS203T	Engineering Mathematics-II	3	1	0	30	20	50		100		150	4
3	KEE201T/ KEC201T	Basic Electrical Engineering/ Emerging Domain in Electronics Engineering	3	0	0	30	20	50		100		150	**3**
4	KCS201T/ KME201T	Programming for Problem Solving / Fundamentals of Mechanical Engineering & Mechatronics	3	0	0	30	20	50		100		150	**3**
5	KAS251P/ KAS252P	Engineering Physics Lab/ Engineering Chemistry Lab	0	0	2				25		25	50	1
6	KEE251P/ KEC251P	Basic Electrical Engineering Lab/ Electronics Engineering Lab	0	0	2				25		25	50	1
7	KCS251P/ KAS254P	Programming for Problem Solving / English Language Lab	0	1	2				25		25	50	1
8	KCE251P/ KWS251P	Engineering Graphics & Design Lab/ Mechanical Workshop Lab	0	1	2				50		50	100	1
9	KMC201/ KMC202	AI For Engineering/ Emerging Technology for Engineering	2	0	0	15	10	25		25		50	2
10	KNC201	Soft Skill II	2	0	0	15	10	25		25			
	MOOCs	(For B.Tech. Hons. Degree) *											
		Total										900	20

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

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

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

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

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

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

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

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

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

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

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

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Course Outcomes (COs)

Common Courses (Offered in 1st Year of all B.Tech Programmes)

1st Year (1st and 2nd Semester)

Academic Year 2021-22 ODD/EVEN Semester

Course Code	Course Name	Course Outcomes (COs) *At the completion of the course, students will be able to:*	
KAS101T/KAS201T	Engineering Physics	CO1	Solve the classical and wave mechanics problems
		CO2	Develop the understanding of laws of thermodynamics and their application in various processes
		CO3	Formulate and solve the engineering problems on Electromagnetism & Electromagnetic Field Theory
		CO4	Aware of limits of classical physics & to apply the ideas in solving the problems in their parent streams
		CO5	Aware about details of Fiber Optics & Laser
KAS102T?KAS202T	Engineering Chemistry	CO1	Use of different analytical instruments
		CO2	Measure molecular/ system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in water.
		CO3	Measure hardness of water.
		CO4	Estimate the rate constant of reaction
		CO5	Aware about general methods of synthesis of organo metallic compounds (Grignard reagent) and their applications
KAS103T	Engineering Mathematics-I	CO1	Remember the concept of matrices and apply for solving linear simultaneous Equation
		CO2	Understand the concept of limit, continuity and differentiability and apply in the study of Rolle's, Lagrange's and Cauchy mean value theorem and Leibnitz theorems
		CO3	Identify the application of partial differentiation and apply for evaluating maxima, minima, series and Jacobians.
		CO4	Illustrate the working methods of multiple integral and apply for finding area, volume, center of mass and center of gravity
		CO5	Remember the concept of vector and apply for directional derivatives, tangent and normal planes. Also evaluate line, surface and volume

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KEE101T/KEE101T	**Basic Electrical Engineering**	**CO1**	Apply the concepts of KVL/KCL and network theorems in solving DC circuits
		CO2	Analyze the steady state behavior of single phase and three phase AC electrical circuits
		CO3	Identify the application areas of a single phase two winding transformer as well as an auto transformer and calculate their effeciency.Also identify the connections of three phase transistor
		CO4	Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications
		CO5	Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption
KEC101T/KEC102T	**Emerging Domain in Electronics Engineering**	**CO1**	Understand the concept of PN Junction and devices
		CO2	Understand the concept of BJT, FET and MOFET
		CO3	Understand the concept of Operational amplifier
		CO4	Understand the concept of measurement instrument
		CO5	Understand the working principle of different type of sensor and their uses
KCS101T/KCS102T	**Programming for Problem Solving**	**CO1**	Develop simple algorithms for arithmetic and logical problems
		CO2	Translate the algorithms to programs & execution (in C language)
		CO3	Implement conditional branching, iteration and recursion
		CO4	Decompose a problem into functions and synthesize a complete program using divide and conquer approach
		CO5	Use arrays, pointers and structures to develop algorithms and programs
KME101T/KME102T	**Fundamentals of Mechanical Engineering & Mechatronics**	**CO1**	Understand the concept of stress and strain, factor of safety, beams
		CO2	Understand the basic component and working of internal combustion engines, electric and hybrid vehicles, refrigerator and heat pumps,air conditioning
		CO3	Understand fluid properties, conservation laws, hydraulic machinery used in real life
		CO4	Understand the working principle of different measuring instrument with the knowledge of accuracy, error and calibration,limit,fit,tolerence and control system
		CO5	Understand concept of mechatronics with their advantages, scope and Industrial application, the different types of mechanical actuation system, the different types of hydraulic and pneumatic systems

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KAS151P/KAS251P	**Engineering Physics Lab**	**CO1**	Determine the wavelength of sodium light by Newton's ring experiment
		CO2	Determine the wavelength of sodium light with the help of Fresnel's bi-prism.
		CO3	Determine the variation of magnetic field with the distance along the axis of a current carrying coil and estimate the radius of the coil
		CO4	Draw hysteresis (B-H curve) of a specimen in the form of a transformer and to determine its hysteresis loss.
		CO5	Measure high resistance by leakage method
KAS152P/KAS252P	**Engineering Chemistry Lab**	**CO1**	Use of different analytical instruments.
		CO2	Measure molecular/system properties such as surface tension, viscosity
		CO3	Measure conductance of solution, chloride and iron content in water, hardness of water
		CO4	Estimate the rate constant of reaction
		CO5	Verify the Beer's law
KEE151P/KAS251P	**Basic Electrical Engineering Lab**	**CO1**	Conduct experiments illustrating the application of KVL/KCL and network theorems to DC electrical circuits
		CO2	Demonstrate the behavior of AC circuits connected to single phase AC supply and measure power in single phase as well as three phase electrical circuits
		CO3	Perform experiment illustrating BH curve of magnetic materials
		CO4	Calculate efficiency of a single-phase transformer and DC machine
		CO5	Perform the experiments on speed measurment and reversal of direction of three phase induction motor and identify the type of DC and AC machines based on their construction
KEC151P/KEC252P	**Electronics Engineering Lab**	**CO1**	Know various types of Active & Passive Components based on their ratings
		CO2	Identify various types of Printed Circuit Boards (PCB) and soldering Techniques
		CO3	Characterize the PN Junction diode
		CO4	Understand Operational Amplifier as Adder and Subtractor
		CO5	Implement of the given Boolean function using logic gates in both SOP and POS forms.
KCS151P/KCS252P	**Programming for Problem Solving Lab**	**CO1**	Implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems
		CO2	Demonstrate an understanding of computer programming
			language concepts
		CO3	Design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage
		CO4	Define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures
		CO5	Develop confidence for self-education and ability for life-long learning needed for Computer language

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KAS154P/KAS254P	**English Language Lab**	**CO1**	Understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e Reading,
			Writing, Listening, Thinking and Speaking.
		CO2	Create substantial base by the formation of strong professional vocabulary for its application at different platforms and through
			numerous modes as Comprehension, reading, writing and speaking etc.
		CO3	Apply it at their workplace for writing purpose such as Presentation/official drafting/ administrative communication and use it for document/ project/ report/ research paper writing
		CO4	Evaluate the correct and error-free writing by being well-versed in rules of English grammar and cultivate relevant technical style of communication &presentation at their work place and also for academic use
		CO5	Apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.
KCE151P/KCE152P	**Engineering Graphics & Design Lab**	**CO1**	Understand the visual aspects of engineering design
		CO2	Understand the engineering graphics standards and solid modelling
		CO3	Have effective communication through graphics
		CO4	Applying modern engineering tools necessary for engineering practice
		CO5	Appling computer-aided geometric design
KWS151P/KWS152P	**Mechanical Workshop Lab**	**CO1**	Use various engineering materials, tools, machines and measuring equipments
		CO2	Perform machine operations in lathe and CNC machine
		CO3	Perform manufacturing operations on components in fitting and carpentry shop
		CO4	Perform operations in welding, moulding, casting and gas cutting
		CO5	Fabricate a job by 3D printing manufacturing technique
KMC101/KMC102	**Artificial Intelligence (AI) For Engineers**	**CO1**	Understand the evolution and various approaches of AI
		CO2	Understand data storage, processing, visualization, and its use in regression, clustering etc.
		CO3	Understand natural language processing and chatbots
		CO4	Understand the concepts of neural networks
		CO5	Understand the concepts of face, object, speech recognition and robots

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KMC102/KMC202	**Emerging Technology for Engineers**	**CO1**	Understand the concepts of internet of things, smart cities and industrial internet of things
		CO2	Understand the concepts of cloud computing
		CO3	Understand the concepts of block chain, cryptocurrencies, smart contracts
		CO4	Understand design principles, tools, trends in 3 D printing and drones
		CO5	Understand augmented reality (AR), virtual reality (VR), 5G technology, brain computer interface and human brain
KNC101	**Soft Skills-I**	**CO1**	Understand the correct usage of grammar
		CO2	Apply the fundamental inputs of communication skills in making speech delivery, individual conference, and group communication
		CO3	Evaluate the impact of interpersonal communication on their performance as a professional and in obtaining professional excellence at the workplace
		CO4	Skills and techniques of persuasion and negotiation would enhance the level of students at multifarious administrative and managerial platforms
		CO5	Equip with basics of communication skills and will apply it fo practical and oral purposes by being honed up in presentation skills and voice-dynamics
KAS203T	**Engineering Mathematics-II**	**CO1**	Understand the concept of differentiation and apply for solving differential equations
		CO2	Remember the concept of definite integral and apply for evaluating surface areas and volumes.
		CO3	Understand the concept of convergence of sequence and series.
			Also evaluate Fourier series.
		CO4	Illustrate the working methods of complex functions and apply for finding analytic functions
		CO5	Apply the concept of complex functions for finding Taylor's series, Laurent's series and evaluation of definite integrals
KNC201	**Soft Skills-II**	**CO1**	Converse well with effective LSRW skills in English.
		CO2	Evaluate the importance of conversation in his/her personal and professional domain and apply it for extending their professional frontiers
		CO3	Apply motivation skills for their individual and professional excellence.
		CO4	Utilize their teamwork and their interpersonal communication skills to survive and excel at their work-place
		CO5	Evaluate creativity for their professional innovation and critical thinking for their competence

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Academic Year 2021-22 ODD/EVEN Semester For Biotechnology only

B.Tech. I Semester(Academic Session 2021-22)

(Biotechnology)

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS101T	Engineering Physics	3	1	0	30	20	50		100		150	4
2	KBT101T/	Elementary Mathematics –I/	3	1	0	30	20	50		100		150	4
3	KEE101T	Basic Electrical Engineering	3	0	0	30	20	50		100		150	3
4	KCS101T	Programming for Problem Solving	3	0	0	30	20	50		100		150	3
5	KAS151P	Engineering Physics Lab	0	0	2				25		25	50	1
6	KEE151P	Basic Electrical Engineering Lab	0	0	2				25		25	50	1
7	KCS151P	Programming for Problem Solving	0	1	2				25		25	50	1
8	KCE151P	Engineering Graphics & Design Lab	0	1	2				50		50	100	1
9	KMC101	AI For Engineering	2	0	0	15	10	25		25		50	2
10	**KNC101**	**Soft Skill I**	2	0	0	15	10	25		25			NC
11	MOOCs	(For B.Tech. Hons. Degree)*											
		Total										900	20

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B.Tech. II Semester(Academic Session 2021-22)

(Biotechnology)

S. No.	Course Code	Course Title	Periods			Evaluation Scheme				End Semester		Total	Credits
			L	T	P	CT	TA	Total	PS	TE	PE		
1	KAS202T	Engineering Chemistry	3	1	0	30	20	50		100		150	4
2	KBT201T/	Elementary Mathematics –II	3	1	0	30	20	50		100		150	4
3	KEC201T	Emerging Domain in Electronics Engineering	3	0	0	30	20	50		100		150	3
4	KME201T	Fundamentals of Mechanical Engineering & Mechatronics	3	0	0	30	20	50		100		150	3
5	KAS252P	Engineering Chemistry Lab	0	0	2				25		25	50	1
6	KEC251P	Electronics Engineering Lab	0	0	2				25		25	50	1
7	KAS254P	English Language Lab	0	1	2				25		25	50	1
8	KCE251P/ KWS251P	Engineering Graphics & Design Lab/ Mechanical Workshop Lab	0	1	2				50		50	100	1
9	KMC202	Emerging Technology for Engineering	2	0	0	15	10	25		25		50	2
10	**KNC201**	**Soft Skill II**	2	0	0	15	10	25		25			NC
	MOOCs	(For B.Tech. Hons. Degree)*											
		Total										900	20

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Course Outcomes (COs)

Common Courses (Offered in 1st Year of Biotechnology B.Tech Programmes)

1st Year (1st and 2nd Semester)

Academic Year 2021-22 ODD/EVEN Semester

Course Code	Course Name	Course Outcomes (COs) *At the completion of the course, students will be able to:*	
KAS101T/KAS201T	Engineering Physics	CO1	Solve the classical and wave mechanics problems
		CO2	Develop the understanding of laws of thermodynamics and their application in various processes
		CO3	Formulate and solve the engineering problems on Electromagnetism & Electromagnetic Field Theory
		CO4	Aware of limits of classical physics & to apply the ideas in solving the problems in their parent streams
		CO5	Aware about details of Fiber Optics & Laser
KAS102T/KAS202T	Engineering Chemistry	CO1	Use of different analytical instruments
		CO2	Measure molecular/ system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in water.
		CO3	Measure hardness of water.
		CO4	Estimate the rate constant of reaction
		CO5	Aware about general methods of synthesis of organo metallic compounds (Grignard reagent) and their applications
KBT101T	Elementary MathematicsMathematics-I	CO1	Understand the concept of algebra for finding the solution of quadratic equation in complex system, algebraic solution of linear inequalities inone variable and create graphical solution of linear inequalities in two variables
		CO2	Understand the concept of permutation and Combination to create the formulation and their connection and apply for evaluating sum and means of AP and GP and some special series
			Understand the concept of permutation and Combination to create the formulation and their connection and apply for evaluating sum and means of AP and GP and some special series
		CO3	Remember the concept of two and three dimensional geometry to applyto find conic section (circle, ellipse, parabola, hyperbola) and to evaluate coordinate plane and distance between two points
		CO4	Apply the concept of derivative to evaluate and analyze rate of change, slope , derivative of polynomial and trigonometric function
		CO5	Remember the concept of derivative to evaluate derivative of composite function, inverse trigonometric function, implicit, composite and exponential functions and apply in Rolle's and Lagranges'theorems and
			their application

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KEE101T/KEE201T	**Basic Electrical Engineering**	**CO1**	Apply the concepts of KVL/KCL and network theorems in solving DC circuits
		CO2	Analyze the steady state behavior of single phase and three phase AC electrical circuits
		CO3	Identify the application areas of a single phase two winding transformer as well as an auto transformer and calculate their effeciency.Also identify the connections of three phase transistor
		CO4	Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications
		CO5	Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption
KEC101T/KEC201T	**Emerging Domain in Electronics Engineering**	**CO1**	Understand the concept of PN Junction and devices
		CO2	Understand the concept of BJT, FET and MOFET
		CO3	Understand the concept of Operational amplifier
		CO4	Understand the concept of measurement instrument
		CO5	Understand the working principle of different type of sensor and their uses
KCS101T/KCS201T	**Programming for Problem Solving**	**CO1**	Develop simple algorithms for arithmetic and logical problems
		CO2	Translate the algorithms to programs & execution (in C language)
		CO3	Implement conditional branching, iteration and recursion
		CO4	Decompose a problem into functions and synthesize a complete program using divide and conquer approach
		CO5	Use arrays, pointers and structures to develop algorithms and programs

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KME101T/MME201T	**Fundamentals of Mechanical Engineering & Mechatronics**	**CO1**	Understand the concept of stress and strain, factor of safety, beams
		CO2	Understand the basic component and working of internal combustion engines, electric and hybrid vehicles, refrigerator and heat pumps,air conditioning
		CO3	Understand fluid properties, conservation laws, hydraulic machinery used in real life
		CO4	Understand the working principle of different measuring instrument with the knowledge of accuracy, error and calibration,limit,fit,tolerence and control system
		CO5	Understand concept of mechatronics with their advantages, scope and Industrial application, the different types of mechanical actuation system, the different types of hydraulic and pneumatic systems
KAS151P/KAS251T	**Engineering Physics Lab**	**CO1**	Determine the wavelength of sodium light by Newton's ring experiment
		CO2	Determine the wavelength of sodium light with the help of Fresnel's bi-prism.
		CO3	Determine the variation of magnetic field with the distance along the axis of a current carrying coil and estimate the radius of the coil
		CO4	Draw hysteresis (B-H curve) of a specimen in the form of a transformer and to determine its hysteresis loss.
		CO5	Measure high resistance by leakage method
KAS152P/KAS251P	**Engineering Chemistry Lab**	**CO1**	Use of different analytical instruments.
		CO2	Measure molecular/system properties such as surface tension, viscosity
		CO3	Measure conductance of solution, chloride and iron content in water, hardness of water
		CO4	Estimate the rate constant of reaction
		CO5	Verify the Beer's law
KEE151P/KEE252P	**Basic Electrical Engineering Lab**	**CO1**	Conduct experiments illustrating the application of KVL/KCL and network theorems to DC electrical circuits
		CO2	Demonstrate the behavior of AC circuits connected to single phase AC supply and measure power in single phase as well as three phase electrical circuits
		CO3	Perform experiment illustrating BH curve of magnetic materials
		CO4	Calculate efficiency of a single-phase transformer and DC machine
		CO5	Perform the experiments on speed measurment and reversal of direction of three phase induction motor and identify the type of DC and AC machines based on their construction

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KEC151P/KEC152P	**Electronics Engineering Lab**	**CO1**	Know various types of Active & Passive Components based on their ratings
		CO2	Identify various types of Printed Circuit Boards (PCB) and soldering Techniques
		CO3	Characterize the PN Junction diode
		CO4	Understand Operational Amplifier as Adder and Subtractor
		CO5	Implement of the given Boolean function using logic gates in both SOP and POS forms.
KCS151P/KCS152P	**Programming for Problem Solving Lab**	**CO1**	Implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems
		CO2	Demonstrate an understanding of computer programming
			language concepts
		CO3	Design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage
		CO4	Define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures
		CO5	Develop confidence for self-education and ability for life-long learning needed for Computer language
KAS154P/KAS254P	**English Language Lab**	**CO1**	Understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e Reading, Writing, Listening, Thinking and Speaking.
		CO2	Create substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as Comprehension, reading, writing and speaking etc.
		CO3	Apply it at their workplace for writing purpose such as Presentation/official drafting/ administrative communication and use it for document/ project/ report/ research paper writing
		CO4	Evaluate the correct and error-free writing by being well-versed in rules of English grammar and cultivate relevant technical style of communication &presentation at their work place and also for academic use
		CO5	Apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.

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KCE151P/KCE251P	**Engineering Graphics & Design Lab**	**CO1**	Understand the visual aspects of engineering design
		CO2	Understand the engineering graphics standards and solid modelling
		CO3	Have effective communication through graphics
		CO4	Applying modern engineering tools necessary for engineering practice
		CO5	Appling computer-aided geometric design
KWS151P/KWS251P	**Mechanical Workshop Lab**	**CO1**	Use various engineering materials, tools, machines and measuring equipments
		CO2	Perform machine operations in lathe and CNC machine
		CO3	Perform manufacturing operations on components in fitting and carpentry shop
		CO4	Perform operations in welding, moulding, casting and gas cutting
		CO5	Fabricate a job by 3D printing manufacturing technique
KMC101/KMC201	**Artificial Intelligence (AI) For Engineers**	**CO1**	Understand the evolution and various approaches of AI
		CO2	Understand data storage, processing, visualization, and its use in regression, clustering etc.
		CO3	Understand natural language processing and chatbots
		CO4	Understand the concepts of neural networks
		CO5	Understand the concepts of face, object, speech recognition and robots
KMC102/KMC202	**Emerging Technology for Engineers**	**CO1**	Understand the concepts of internet of things, smart cities and industrial internet of things
		CO2	Understand the concepts of cloud computing
		CO3	Understand the concepts of block chain, cryptocurrencies, smart contracts
		CO4	Understand design principles, tools, trends in 3 D printing and drones
		CO5	Understand augmented reality (AR), virtual reality (VR), 5G technology, brain computer interface and human brain
KNC101	**Soft Skills-I**	**CO1**	Understand the correct usage of grammar.
		CO2	Apply the fundamental inputs of communication skills in making speech delivery, individual conference, and group communication
		CO3	Evaluate the impact of interpersonal communication on their performance as a professional and in obtaining professional excellence at the workplace
		CO4	Skills and techniques of persuasion and negotiation would enhance the level of students at multifarious administrative and managerial platforms
		CO5	Equip with basics of communication skills and will apply it for practical and oral purposes by being honed up in presentation skills and voice-dynamics

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KBT 201T	Elementary Mathematics-II	**CO1**	Apply the concept of integral for finding areas of circles/parabolas/ellipses and area between these curves
		CO2	Remember the concept of differential equation for finding solution ofdifferent types of differential equations
			Remember the concept of differential equation for finding solution ofdifferent types of differential equations
		CO3	Understand the concept of vectors to evaluate directional derivatives, and create projection of a vector of a line
		CO4	Remember the concept of three dimensional geometry to apply for finding Cartesian equation of a line, shortest distance, angle between two lines, shortest distance, distance of a point from a plane
		CO5	Remember the concept of probability to evaluate the probability in
			different situation, probability distribution and analyse their properties
KNC201	**Soft Skills-II**	**CO1**	Converse well with effective LSRW skills in English.
		CO2	Evaluate the importance of conversation in his/her personal and professional domain and apply it for extending their professional frontiers
		CO3	Apply motivation skills for their individual and professional excellence.
		CO4	Utilize their teamwork and their interpersonal communication skills to survive and excel at their work-place
		CO5	Evaluate creativity for their professional innovation and critical thinking for their competence

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