Program Outcomes (POs) Program Specific Outcomes (PSOs) Course Outcomes (COs) & CO-PO/PSO Course Articulation Matrices

B.TECH. 1ST YEAR

BRCM
College of Engineering & Technology

Program Outcomes (PO) as defined by NBA

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **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.
3. **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.
4. **Conduct investigations of complex problems**: Use research- based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

PSO1: Educate students to think and participate deeply, creatively, and analytically in courses of 1st year.
PSO2: Foster the development of effective oral and written communication skills.

B.TECH. 1ST YEAR

Semiconductor Physics
(BSC-PHY-103G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-103G.1 (CO1)	Pupil will be able to recall and describe the differentiation of materials on basis of band structure. The students will also be able to evoke the diode biasing, free electron theory and low dimensional particles.	Remember (L1)
BSC-PHY-103G.2 (CO2)	Students will be able to explain the concept of electronic materials especially semiconductors and their interaction with light; and the different measurement techniques for studying material properties.	Understand (L2)
BSC-PHY-103G.3 (CO3)	Pupil will be able to apply their knowledge to illustrate the fabrication/creation and characterization of various electronic materials like diodes, low dimensional materials.	Apply (L3)
BSC-PHY-103G.4 (CO4)	Students will be able to compare the various measurement techniques and investigate various problems related to free electron and band theory.	Analyse (L4)
BSC-PHY-103G.5 (CO5)	Pupil will also be able to evaluate/solve different numerical problems and derivations of important parameters and assess their results with appropriate justification.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-PHY-103G.1 (CO1)	3	2	-	-	-	-	-			2	-	1	3	3
BSC-PHY-103G.2 (CO2)	3	2	-	-	-	-	-			2	-	1	3	3
BSC-PHY-103G.3 (CO3)	1	3	-	-	-	-	-			2	-	2	2	3
BSC-PHY-103G.4 (CO4)	1	2	-	-	-	-	-			2	-	3	3	2
BSC-PHY-103G.5 (CO5)	1	2	-	-	-	-	-			3	-	2	3	2

Semiconductor Physics Lab
(BSC-PHY-113G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-113G.1 (CO1)	Pupil will be able to recall the basic components of Physics lab, for example: diodes, transistor, ammeter, voltmeter, galvanometer, etc. Student will also be able to remember about the least count, scales on graph and graph plot.	Remember (L1)
BSC-PHY-113G.2 (CO2)	Students will be able to understand the concept of correct circuit connections; for example, connection of ammeter, voltmeter, diodes, and solar cells in the circuit.	Understand (L2)
BSC-PHY-113G.3 (CO3)	Pupil will be able to apply their knowledge in making correct circuit; and in applying correct required formulae in different experiments	Apply (L3)
BSC-PHY-113G.4 (CO4)	Students will be able to analyse the circuit connections and formulae applicable for different experiments related to semiconductor physics.	Analyse (L4)
BSC-PHY-113G.5 (CO5)	Pupil will also be able to evaluate the desired results of the experiments either by correct formulae or plotted graphs. Student will also be able to manage their performed practical task in representable manner.	Evaluate (L5)

COURSE ARTICULATION MATRIX														
CO	**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**
BSC-PHY-113G.1 (CO1)	3	-	-	-	-	-	-	2	-	-	2	1	3	3
BSC-PHY-113G.2 (CO2)	2	3	-	-	-	-	-	2	2	1	2	1	3	2
BSC-PHY-113G.3 (CO3)	2	3	-	-	3	-	-	2	2	1	3	1	3	3
BSC-PHY-113G.4 (CO4)	2	2	-	2	3	-	-	1	1	1	3	3	3	2
BSC-PHY-113G.5 (CO5)	2	2	-	3	1	-	-	1	1	3	2	3	3	3

Waves and Optics & Quantum Mechanics
(BSC-PHY-102G)

BSC-PHY-102G.1 (CO1)	Pupil will be able to recall S.H.M., wave nature of light. Students will also be able to evoke difference between classical and quantum Physics.	Remember (L1)
BSC-PHY-102G.2 (CO2)	Students will be able to understand the concept of wave properties of light, difference in types of Laser and basic concepts of quantum mechanics.	Understand (L2)
BSC-PHY-102G.3 (CO3)	Pupil will be able to apply their theoretical knowledge to categorize different types of harmonic motion; and relate different phenomenon as per wave properties.	Apply (L3)
BSC-PHY-102G.4 (CO4)	Students will be able to analyse the problems related to optics, lasers and quantum mechanics. Students will be able to differentiate various types of oscillators; lasers.	Analyse (L4)
BSC-PHY-102G.5 (CO5)	Students will be able to evaluate numerical related to waves and optics. Student will also be able to derive important relations of waves and optics and come to conclusion of their studies.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-PHY-102G.1 (CO1)	3	2	-	-	-	-	-	-	-	2	-	1	3	3
BSC-PHY-102G.2 (CO2)	3	2	-	-	-	-	-	-	-	2	-	1	3	3
BSC-PHY-102G.3 (CO3)	1	3	-	-	-	-	-	-	-	2	-	2	2	3
BSC-PHY-102G.4 (CO4)	1	2	-	-	-	-	-	-	-	2	-	3	3	2
BSC-PHY-102G.5 (CO5)	1	2	-	-	-	-	-	-	-	3	-	2	3	2

Wave Optics and Quantum Mechanics Lab
(BSC-PHY-112G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-112G.1 (CO1)	Pupil will be able to recall the basic components of Physics lab, for example: diodes, transistor, ammeter, voltmeter, galvanometer, etc. Student will also be able to remember about the least count, scales on graph and graph plot.	Remember (L1)
BSC-PHY-112G.2 (CO2)	Students will be able to understand the concept of correct circuit connections; for example, connection of ammeter, voltmeter, diodes, and solar cells in the circuit.	Understand (L2)
BSC-PHY-112G.3 (CO3)	Pupil will be able to apply their knowledge in making correct circuit; and in applying correct required formulae in different experiments	Apply (L3)
BSC-PHY-112G.4 (CO4)	Students will be able to analyse the circuit connections and formulae applicable for different experiments related to waves and optics	Analyse (L4)
BSC-PHY-112G.5 (CO5)	Pupil will also be able to evaluate the desired results of the experiments either by correct formulae or plotted graphs. Student will also be able to manage their performed practical task in representable manner.	Evaluate (L5)

COURSE ARTICULATION MATRIX														
CO	**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**
BSC-PHY-112G.1 (CO1)	3	-	-	-	-	-	-	2		-	-	1	3	3
BSC-PHY-112G.2 (CO2)	2	3	-	-	-	-	-	2	2	1	-	1	3	2
BSC-PHY-112G.3 (CO3)	2	3	-	-	3	-	-	2	2	1	-	1	3	3
BSC-PHY-112G.4 (CO4)	2	2	-	2	3	-	-	1	1	1	-	3	3	2
BSC-PHY-112G.5 (CO5)	2	2	-	3	1	-	-	1	1	3	-	3	3	3

Mechanics
BSC-PHY-104G

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-104G.1 (CO1)	Pupil will be able to recall Scalars and vectors; Newton's laws of motion; friction, angular momentum and other important terms of mechanical Physics.	Remember (L1)
BSC-PHY-104G.2 (CO2)	Students will be able to understand the concepts of mechanical Physics.	Understand (L2)
BSC-PHY-104G.3 (CO3)	Pupil will be able to apply their theoretical knowledge to discuss static and dynamic mechanics.	Apply (L3)
BSC-PHY-104G.4 (CO4)	Students will be able to analyse the problems related to mechanics.	Analyse (L4)
BSC-PHY-104G.5 (CO5)	Students will be able to evaluate important derivations related to mechanics.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-PHY-104G.1 (CO1)	3	2	-	-	-	-	-	-	-	2	-	1	3	3
BSC-PHY-104G.2 (CO2)	3	2	-	-	-	-	-	-	-	2	-	1	3	3
BSC-PHY-104G.3 (CO3)	1	3	-	-	-	-	-	-	-	2	-	2	2	3
BSC-PHY-104G.4 (CO4)	1	2	-	-	-	-	-	-	-	2	-	3	3	2
BSC-PHY-104G.5 (CO5)	1	2	-	-	-	-	-	-	-	3	-	2	3	2

Mechanics Lab
BSC-PHY-114G

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-114G.1 (CO1)	Pupil will be able to recall the basic components of Physics lab, for example: diodes, transistor, ammeter, voltmeter, galvanometer, etc. Student will also be able to remember about the least count, scales on graph and graph plot.	Remember (L1)
BSC-PHY-114G.2 (CO2)	Students will be able to understand the principle of experiments.	Understand (L2)
BSC-PHY-114G.3 (CO3)	Pupil will be able to apply their knowledge in making correct circuit; and in applying correct required formulae in different experiments	Apply (L3)
BSC-PHY-114G.4 (CO4)	Students will be able to analyse the connections and formulae applicable for different experiments related to waves and optics	Analyse (L4)
BSC-PHY-114G.5 (CO5)	Pupil will also be able to evaluate the desired results of the experiments either by correct formulae or plotted graphs. Student will also be able to manage their performed practical task in representable manner.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	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
BSC-PHY-114G.1 (CO1)	3	-	-	-	-	-	-	2		-	-	1	3	3
BSC-PHY-114G.2 (CO2)	2	3	-	-	-	-	-	2	2	1	-	1	3	2
BSC-PHY-114G.3 (CO3)	2	3	-	-	3	-	-	2	2	1	-	1	3	3
BSC-PHY-114G.4 (CO4)	2	2	-	2	3	-	-	1	1	1	-	3	3	2
BSC-PHY-114G.5 (CO5)	2	2	-	3	1	-	-	1	1	3	-	3	3	3

Introduction to Electromagnetic Theory
BSC-PHY-101G

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-104G.1 (CO1)	Pupil will be able to recall Scalars and vectors; basic terms of electro- and magneto-statics.	Remember (L1)
BSC-PHY-104G.2 (CO2)	Students will be able to understand the concepts of electrostatics, magnetostatics and electromagnetic waves.	Understand (L2)
BSC-PHY-104G.3 (CO3)	Pupil will be able to apply their theoretical knowledge to discuss electromagnetism along with electrostatics and magnetostatics.	Apply (L3)
BSC-PHY-104G.4 (CO4)	Students will be able to analyse the difference between electrostatics and electrodynamics. Pupil will also be able to differentiate materials on basis of magnetic properties.	Analyse (L4)
BSC-PHY-104G.5 (CO5)	Students will be able to evaluate important derivations related to electrostatics, magnetostatics and electromagnetism.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-PHY-101G.1 (CO1)	3	2	-	-	-	-	-	-	-	2	-	1	3	3
BSC-PHY-101G.2 (CO2)	3	2	-	-	-	-	-	-	-	2	-	1	3	3
BSC-PHY-101G.3 (CO3)	1	3	-	-	-	-	-	-	-	2	-	2	2	3
BSC-PHY-101G.4 (CO4)	1	2	-	-	-	-	-	-	-	2	-	3	3	2
BSC-PHY-101G.5 (CO5)	1	2	-	-	-	-	-	-	-	3	-	2	3	2

Introduction to Electromagnetic Theory Lab
BSC-PHY-111G

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-PHY-111G.1 (CO1)	Pupil will be able to recall the basic components of Physics lab, for example: diodes, transistor, ammeter, voltmeter, galvanometer, etc. Student will also be able to remember about the least count, scales on graph and graph plot.	Remember (L1)
BSC-PHY-111G.2 (CO2)	Students will be able to understand the concept of correct circuit connections.	Understand (L2)
BSC-PHY-111G.3 (CO3)	Pupil will be able to apply their knowledge in making correct circuit; and in applying correct required formulae in different experiments.	Apply (L3)
BSC-PHY-111G.4 (CO4)	Students will be able to analyse the circuit connections and formulae applicable for different experiment.	Analyse (L4)
BSC-PHY-111G.5 (CO5)	Pupil will also be able to evaluate the desired results of the experiments either by correct formulae or plotted graphs. Student will also be able to manage their performed practical task in representable manner.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	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
BSC-PHY-111G.1 (CO1)	3	-	-	-	-	-	-	2		-	-	1	3	3
BSC-PHY-111G.2 (CO2)	2	3	-	-	-	-	-	2	2	1	-	1	3	2
BSC-PHY-111G.3 (CO3)	2	3	-	-	3	-	-	2	2	1	-	1	3	3
BSC-PHY-111G.4 (CO4)	2	2	-	2	3	-	-	1	1	1	-	3	3	2
BSC-PHY-111G.5 (CO5)	2	2	-	3	1	-	-	1	1	3	-	3	3	3

CALCULUS AND MATRICES
(BSC-MATH-101G)

BSC-MATH-101G.1 (CO1)	Pupil will be able to recall the basics of calculus, matrices and their application of analysis to Engineering problems.	Remember (L1)
BSC-MATH-101G.2 (CO2)	Students will be able to understand the tool of power series and Fourier series for learning advanced Engineering Mathematics.	Understand (L2)
BSC-MATH-101G.3 (CO3)	Pupil will be able to apply the essential tool of matrices and linear algebra in a comprehensive manner.	Apply (L3)
BSC-MATH-101G.4 (CO4)	Students will be able to analyse the functions of several variables that are essential in most branches of engineering.	Analyse (L4)
BSC-MATH-101G.5 (CO5)	Pupil will also be able to evaluate/solve the problems related to calculus and matrices like Eigen value, Eigen vector of a matrix.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	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
BSC-MATH-101G.1 (CO1)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-101G.2 (CO2)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-101G.3 (CO3)	2	3	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-101G.4 (CO4)	3	3	-	-	-	-	-	-	-	-	-	2	2	3
BSC-MATH-101G.5 (CO5)	3	3	-	-	-	-	-	-	-	-	-	2	3	2

CALCULUS AND LINEAR ALGEBRA
(BSC-MATH-103G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-MATH-103G1 (CO1)	The students will be able to recall the basic concept of differential and integral calculus and linear algebra.	Remember (L1)
BSC-MATH-103G.2 (CO2)	Students will be able to understand the concept of solution of linear equation, rank of a matrix, linear dependence and independence of vectors.	Understand (L2)
BSC-MATH-103G.3 (CO3)	Pupil will be able to apply their knowledge to solve the essential tools of matrices and linear algebra including linear transformations, diagonalization and orthogonalization.	Apply (L3)
BSC-MATH-103G.4 (CO4)	Students will be able to analyse different type of solution of calculus and liner algebra.	Analyse (L4)
BSC-MATH-103G.5 (CO5)	Pupil will also be able to evaluate/solve the problems related to calculus and linear algebra.	Evaluate (L5)

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-MATH-103G.1 (CO1)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-103G.2 (CO2)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-103G.3 (CO3)	2	3	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-103G.4 (CO4)	3	3	-	-	-	-	-	-	-	-	-	2	2	3
BSC-MATH-103G.5 (CO5)	3	3	-	-	-	-	-	-	-	-	-	2	3	2

Multivariable Calculus, Differential equations and Complex Analysis
BSC-MATH-102G

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-MATH-102G1 (CO1)	Pupil will be able to recall the mathematical tools needed in evaluating multiple integrals & differential equation and their usage.	Remember (L1)
BSC-MATH-102G.2 (CO2)	Students will be able to understand the effective mathematical tools for the solutions of differential equations and integral.	Understand (L2)
BSC-MATH-102GG.3 (CO3)	Pupil will be able to apply the tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.	Apply (L3)
BSC-MATH-102G.4 (CO4)	Students will be able to analyse that how to deal with functions of several variables and complex variable (differentiation and integration) that are essential in most branches of engineering.	Analyse (L4)
BSC-MATH-102G.5 (CO5)	Pupil will also be able to evaluate/solve the problems related to Multivariable Calculus, Differential equations and Complex Analysis.	Evaluate (L5)

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-MATH-102G.1 (CO1)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-102G.2 (CO2)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-102G.3 (CO3)	2	3	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-102G.4 (CO4)	3	3	-	-	-	-	-	-	-	-	-	2	3	3
BSC-MATH-102G.5 (CO5)	3	3	-	-	-	-	-	-	-	-	-	2	2	2

Probability and Statistics
(BSC-MATH-104G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-MATH-104G.1 (CO1)	Pupil will be able to recall The mathematical tools needed in evaluating statistical data.	Remember (L1)
BSC-MATH-104G.2 (CO2)	Students will be able to understand the ideas of probability and random variables and various discrete and continuous probability distributions and their properties.	Understand (L2)
BSC-MATH-104GG.3 (CO3)	Pupil will be able to apply the statistical methods of studying data samples.	Apply (L3)
BSC-MATH-104G.4 (CO4)	Students will be able to analyse the basic ideas of statistics including measures of central tendency, correlation and regression.	Analyse (L4)
BSC-MATH-104G.5 (CO5)	Pupil will also be able to evaluate/solve the mathematical problems related to probability and Statistics.	Evaluate (L5)

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
BSC-MATH-104G.1 (CO1)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-104G.2 (CO2)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-104G.3 (CO3)	2	3	-	-	-	-	-	-	-	-	-	1	3	3
BSC-MATH-104G.4 (CO4)	3	3	-	-	-	-	-	-	-	-	-	2	3	3
BSC-MATH-104G.5 (CO5)	3	3	-	-	-	-	-	-	-	-	-	2	2	2

Chemistry
(BSC-CHE-101G)

BSC-CHE-101G1 (CO1)	Pupil will be to Recall atomic and molecular structure. The students will also be able to evoke periodic properties	Remember (L1)
BSC-CHE-101G.2 (CO2)	Students will be to Understand the concept of hardness of water, corrosion and various chemical reactions.	Understand (L2)
BSC-CHE-101G.3 (CO3)	Students will be to Apply basic chemistry knowledge in engineering field.	Apply (L3)
BSC-CHE-101G.4 (CO4)	Students will be to Analyse/ Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	Analyse (L4)
BSC-CHE-101G.5 (CO5)	Students will be to Evaluate periodic properties such as ionization potential, electro negativity, oxidation states and electron affinity.	Evaluate (L5)

CO	**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**
BSC-CHE-101G.1 (CO1)	3	3	-	-	-	-	1	2	2	3	-	3	3	3
BSC-CHE-101G.2 (CO2)	3	3	-	-	-	-	1	2	1	3	-	3	3	3
BSC-CHE-101G.3 (CO3)	3	3	-	-	-	-	1	2	1	3	-	3	3	3
BSC-CHE-101G.4 (CO4)	3	3	-	-	-	-	1	2	1	3	-	3	3	3
BSC-CHE-101G.5 (CO5)	3	3	-	-	-	-	1	2	1	3	-	3	3	3

Chemistry Lab
(BSC-CHE-102G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-CH-102G.1 (CO1)	Pupil will be able to recall the rate constants of reactions from concentration of reactants/products as a function of time.	Remember (L1)
BSC-CH-102G.2 (CO2)	Students will be able to understand the molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, etc	Understand (L2)
BSC-CH-102G.3 (CO3)	Pupil will be able to apply their knowledge in synthesizing a small drug molecule and analyse a salt sample.	Apply (L3)
BSC-CH-102G.4 (CO4)	Students will be able to analyse / Determine hardness and chloride content of water.	Analyse (L4)
BSC-CH-102G.5 (CO5)	Pupil will also be able to analyse a salt sample.	Analyse (L4)

COURSE ARTICULATION MATRIX														
CO	**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**
BSC-CH-102G.1 (CO1)	3	-	-	-	-	-	-	2		-	-	1	3	3
BSC-CH-102G.2 (CO2)	1	3	-	-	-	-	-	2	1	1	-	1	3	3
BSC-CH-102G.3 (CO3)	2	3	-	-	2	-	-	2	1	1	-	1	2	2
BSC-CH-102G.4 (CO4)	2	1	-	1	3	-	-	2	1	1	-	3	2	2
BSC-CH-102G.5 (CO5)	2	2	-	3	1	-	-	1	1	2	-	2	3	1

ENGINEERING GRAPHICS & DESIGN
(ESC-ME- 101G)

ESC-ME- 101G.1 (CO1)	To RECALL the basic knowledge about the Engineering Graphics & Drawing.	Remember (L1)
ESC-ME- 101G.2 (CO2)	To Illustrate the orthographic Projections of Points and lines inclined to both planes; Projections of planes inclined Planes - Auxiliary Planes, solids, section of solid, isometric Projection and Overview of Computer Graphics.	Understand (L2)
ESC-ME- 101G.3 (CO3)	To Applying concept of projection of point, line, plane, solid , section of solid development of surfaces and computer-aided design and find shape of practical existing problem.	Apply (L3)
ESC-ME- 101G.4 (CO4)	To apply knowledge in fabrication/creation and characterization of various shapes of solid objects.	Analyse (L4)
ESC-ME- 101G.5 (CO5)	To Evaluate our design to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	Evaluate (L5)

COURSE ARTICULATION MATRIX														
CO	**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**
ESC-ME-101G.1 (CO_1)	3	2		-		-	-	-	-	2	-	1	3	3
ESC-ME-101G.2 (CO_2)	3	2		-	2	-	-	-	-	2	-	1	3	3
ESC-ME-101G. 3 (CO_3)	2	3		-	2	-	-	-	-	1	-	1	3	3
ESC-ME-101G.4 (CO_4)	2	2	2	-	1	-	-	-	-	1	-	3	3	3
ESC-ME-101G.5 (CO_5)	2	2	3	-	1	-	-	-	-	1	-	3	3	3

Basic of Electrical Engineering
(BSC-EE-101 G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-EE-101G.1 (CO1)	To **RECALL** the basic knowledge about the DC Circuit and AC Circuit. LT switcher, cable, and Batteries.	Remember (L1)
BSC-EE-101G.2 (CO2)	To **Illustrate** the Construction of Machines (A.C/D.C and Transformer) and Measuring Instrument.	Understand (L2)
BSC-EE-101G.3 (CO3)	To **Applying** concept of theorem's, Star-Delta concept of voltage and current for 3- ϕ system.	Apply (L3)
BSC-EE-103G.4 (CO4)	To **Analyses** the losses, voltage regulation efficiency, in Machine.	Analyse (L4)
BSC-EE-103G.5 (CO5)	To **Evaluate** Electrical parameters for Batteries, Machine, DC and AC Network.	Evaluate (L5)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ESC-EE-101G.1 (CO1)	3	2	-	-	-	-	-			2	-	1	3	3
ESC-EE-101G.2 (CO2)	3	2	-	-	-	-	-			2	-	1	3	3
ESC-EE-101G.3 (CO3)	1	3	-	-	-	-	-			2	-	2	2	3
ESC-EE-101G.4 (CO4)	1	2	-	-	-	-	-			2	-	3	3	2
ESC-EE-101G.5 (CO5)	1	2	-	-	-	-	-			3	-	2	3	2

Basic of Electrical Engineering Lab
(BSC-EE-102 G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
BSC-EE-102G.1 (CO1)	To **RECALL** the basic knowledge measuring instruments.	Remember (L1)
BSC-EE-102G.2 (CO2)	To **Verify** the Network Theorems	Understand (L2)
BSC-EE-102G.3 (CO3)	To **Demonstrate** of cut out sections of Machines	Apply (L3)
BSC-EE-102G.4 (CO4)	To **Perform** test of Transformer	Analyse (L4)
BSC-EE-102G.5 (CO5)	To **Measure** the Power in a 3-phase system and responses of R-L circuits.	Evaluate (L5)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ESC-EE-102G.1 (CO1)	3	-	-	-	-	-	-	2		-	-	1	3	3
ESC-EE-102G.2 (CO2)	2	3	-	-	-	-	-	2	2	1	-	1	3	3
ESC-EE-102G.3 (CO3)	2	3	-	-	3	-	-	2	2	1	-	1	3	2
ESC-EE-102G.4 (CO4)	2	2	-	1	3	-	-	2	1	1	-	3	3	2
ESC-EE-102G.5 (CO5)	2	2	-	3	1	-	-	1	1	3	-	3	3	1

Programming for Problem Solving
(ESC-CSE-101G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
ESC-CSE-102G.1 (CO1)	To Explain various computer components, design flowchart and Algorithm, write program in C programming language.	Remember (L1)
ESC-CSE-102G.2 (CO2)	To use different data types and operators to write programs.	Understand (L2)
ESC-CSE-102G.3 (CO3)	To test and execute the programs and correct syntax and logical errors.	Apply (L3)
ESC-CSE-102G.4 (CO4)	To analyze the problems by applying programming concepts using decision control statements and loop control statements	Analyse (L4)
ESC-CSE-102G.5 (CO5)	To Formulate the problem by apply the programming concepts using array, structure, pointer and functions	create (L6)

COURSE ARTICULATION MATRIX

CO	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_{10}	PO_{11}	PO_{12}	PSO1	PSO2
ESC-CSE-102G.1 (CO1)	3	2	-	-	-	-	-			2	-	1	3	3
ESC-CSE-102G.2 (CO2)	3	2	-	-	-	-	-			2	-	1	3	3
ESC-CSE-102G.3 (CO3)	1	3	-	-	-	-	-			2	-	2	2	3
ESC-CSE-102G.4 (CO4)	1	2	-	-	-	-	-			2	-	3	3	2
ESC-CSE-102G.5 (CO5)	1	2	-	-	-	-	-			3	-	2	3	2

Programming in C Lab
(ESC-CSE-104G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
ESC-CSE-104G.1 (CO1)	To explain the basic computer concepts and programming principles of C language.	Understand (L2)
ESC-CSE-104G.2 (CO2)	To Implement the algorithms for simple problems and translate given algorithms to a working and correct program.	Applying (L3)
ESC-CSE-104G.3 (CO3)	To be able to correct syntax errors as reported by the compilers and identify and correct logical errors encountered at run time.	Analyse (L4)
ESC-CSE-104G.4 (CO4)	To be able to develop programs using decision structures, loops and functions.	create (L6)
ESC-CSE-104G.5 (CO5)	To be able to develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings and functions.	create (L6)

COURSE ARTICULATION MATRIX

CO	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
ESC-CSE-104G.1 (CO1)	3	2	-	-	-	-	-	-	-	-	-	1	3	3
ESC-CSE-104G.2 (CO2)	2	3	2	2	-	-	-	-	-	-	-	1	3	2
ESC-CSE-104G.3 (CO3)	2	3	1	2	-	-	-	-	-	-	-	1	3	3
ESC-CSE-104G.4 (CO4)	2	2	3	1	1	-	-	-	-	-	-	1	3	2
ESC-CSE-104G.5 (CO5)	2	2	3	1	1	-	-	-	-	-	-	1	3	3

Workshop Technology
(ESC-ME-102G)

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
ESC-ME-102G.1 (CO1)	To **define** various industrial safety measures for the production of products in the manufacturing sectors	Remember (L1)
ESC-ME-102G.2 (CO2)	To **outline** the manufacturing process for particular applications	Understand (L2)
ESC-ME-102G.3 (CO3)	To **Identify** the various materials for the manufacturing process for particular applications	Apply (L3)
ESC-ME-102G.4 (CO4)	To **analyze** the metal casting techniques and the basic structure of the product	Analyse (L4)
ESC-ME-102G.5 (CO5)	To **interpret** the various sheet metal works and welding processes in practice for production	Evaluate (L5)

CO	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
ESC-ME-102G.1 (CO1)	3	2	-	-	2	-	-	2	3	3	-	3	3	3
ESC-ME-102G.2 (CO2)	3	2	-	-	2	-	-	2	3	3	-	3	3	3
ESC-ME-102G.3 (CO3)	3	2	-	-	-	-	-	2	3	3	-	3	3	3
ESC-ME-102G.4 (CO4)	3	2	-	-	2	-	-	2	3	3	-	3	3	3
ESC-ME-102G.5 (CO5)	3	2	-	-	-	-	-	2	3	3	-	3	3	3

Manufacturing Practices Lab

ESC-ME-103G

Course Outcome (CO)	Details of Course Outcomes	Bloom's Taxonomy
ESC-ME-103G.1 (CO1)	To **describe** the appropriate tools, materials, instruments required for specific operations in workshop.	Remember (L1)
ESC-ME-103G.2 (CO2)	To **understand** the figures of the hand tools used in fitting, carpentry, foundry, welding shop and machine tools such as lathe machine and drilling machine.	Understand (L2)
ESC-ME-103G.3 (CO3)	To **apply** techniques to perform basic operations with hand tools and power tools such as center lathe machine, drilling machine using given job drawing.	Apply (L3)
ESC-ME-103G.4 (CO4)	To **analyze** a report related to hand tools and machine tools description referring to library books and laboratory manuals.	Analyse (L4)
ESC-ME-103G.5 (CO5)	To **predict** reports of procedures followed for a given task in fitting, carpentry, foundry, sheet metals, welding and machine shops.	Evaluate (L5)

COURSE ARTICULATION MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ESC-ME-103G.1 (CO1)	3	-	-	-	2	-	-	1	3	-	-	1	3	3
ESC-ME-103G.2 (CO2)	3	-	-	-	2	-	-	1	3	1	-	1	3	3
ESC-ME-103G.3 (CO3)	3	-	-	-	2	-	-	-	3	-	-	-	3	3
ESC-ME-103G.4 (CO4)	-	-	-	-	2	-	-	1	3	-	-	-	3	3
ESC-ME-103G.5 (CO5)	3	-	-	-	-	-	-	1	3	1	-	-	3	3