COURSE OUTCOMES (COs) – PROGRAMME OUTCOMES (POs) – PROGRAMMME SPECIFIC OUTCOMES (PSOs) MAPPING

COURSE – MECHANICAL ENGINEERING

CUMMINS COLLEGE OF ENGINEERING FOR WOMEN, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE ARTICULATION MATRIX

(Mapping of Course Outcomes of Courses with Program Outcomes and Program Specific Outcomes)

UG Program of Mechanical Engineering

Course Code	Semester	Course Title	CO No.	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BSE 1-1T	FIRST	MATHEMATICS - I	BES1-1.1	***Analyze*** *real world scenarios to recognize when derivatives or integrals are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) to solve the problems using multiple Approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES1-1.2	***Appreciate*** *ODE and system of ODEs concepts that are encountered in the real world, understand and be able to communicate the underlying mathematics involved to help another person gain insight into the situation.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES1-1.3	***Apply*** *knowledge of mathematics, physics, and modern computing tools to scientific and engineering problems.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES1-1.4	***Develop*** *an ability to identify, formulate and/or solve real world problems.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES1-1.5	***Understand*** *the impact of scientific and engineering solutions in a global and societal context.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
BSE 1-2T	FIRST	APPLIED PHYSICS	BES1T2.1	***Apply*** *concepts in interference and diffraction to* ***solve*** *relevant numerical problems and to relate to relevant engineering applications*	1	2	-	-	-	-	-	-	-	-	-	1	-	-	-
			BES1T2.2	***Learn*** *the basic concepts of dual nature of matter and wave packet and* ***apply*** *them to* ***analyze*** *various relevant phenomena and to solve related numerical problems*	1	2	-	-	-	-	-	-	-	-	-	1	-	-	-

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			BES1T2.3	***Recall*** *the basic concepts of crystal structure and* ***apply*** *them in solving numerical problems based on them and in relating to applications for determination of crystal structure*	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
			BES1T2.4	***Relate*** *the basic idea of total internal reflection to the propagation of light in an optical fiber and* ***make use*** *of the fiber concepts to solve numerical problems and relate to applications in engineering*	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
			BES1T2.5	***Find*** *how to extend the basic concepts of motion of charged particles in electric magnetic fields to solve numerical problems and* ***to relate*** *to applications in electron optic devices and CRO*	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
					1	**1.8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
BSE 1-3T	**FIRST**	**ENERGY AND ENVIRONMENT**	**BESI-3T.1**	***To obtain*** the knowledge of solid and gaseous fuels and their Calorific Value determination	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
			BESI-3T.2	***To recognize*** the type of liquid fuels and their uses in IC engines.	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
			BESI-3T.3	***To apply*** the knowledge about the use of alternative sources of energy & utilize solid waste as energy source	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
			BESI-3T.4	***To analyze*** the impacts of Industrial pollution and its control.	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
			BESI-3T.5	***To develop*** innovative ideas for use of advanced materials in sustainable development	**-**		**3**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
					3	**3**	**3**	**-**	**-**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
BSE 1-4T	**FIRST**	**COMMUNICATIONS SKILLS**	**BSE1-4T.1**	*To* ***Understand*** the importance of communication *and overcome barriers of communication.*	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**
			BSE1-4T.2	***Acquire*** *public speaking skills and handle group situation professionally.*	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**

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			BSE1-4T.3	*To comprehend passages and compose paragraph.*	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
			BSE1-4T.4	*To **construct** error free and meaningful sentence in English.*	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
					-	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-
BSE 1-5T	**FIRST**	**ENGINEERING GRAPHICS**	**BSE 1-5T.1**	***Understand** basic knowledge of Engineering Graphics such as instruments, lines etc, and construct various engineering curves and basic of orthographic projection through drawing the projection of point and line*	2	-	2	-	-	-	-	-	-	1	-	1	1	2	1
			BSE 1-5T.2	***Understand** different types of projection of planes (2D) & solid (3D) and will be able to draw different views of planes and solids*	2	-	2	-	-	-	-	-	-	1	-	1	2	1	1
			BSE 1-5T.3	***Understand** concept of sectioning and development of lateral surfaces of solid and able to represent it.*	2	-	2	-	-	-	-	-	-	1	-	1	2	1	1
			BSE 1-5T.4	***Apply** visualization skill to draw a simple isometric projection views from given orthographic views precisely using drawing instruments*	2	-	2	-	-	-	-	-	-	1	-	1	1	1	1
					2	-	2	-	-	-	-	-	-	1	-	1	1.5	1.3	1
BSE 1-6T	**FIRST**	**BASICS OF CIVIL AND MECHANICAL ENGINEERING**	**BSE 1-6T.1**	***Understand** role of Civil Engineering specializations in development of nation and Society.*	-	-	-	-	-	1	-	2	-	-	-	1	-	-	-
			BSE 1-6T.2	***Explore** the Civil Engineering aspects of different ancient monuments and recently constructed marvelous monuments*	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-
			BSE 1-6T.3	***Understand** basic manufacturing processes and working principle of different mechanisms with its application.*	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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			BSE 1-6T.4	***Analyze*** *the various renewable and non-renewable energy sources.*	2	-	-	-	-	-	-	-	-	-	-	2	-	-	-
			BSE 1-6T.5	***Explore*** *various types of road vehicles and their specifications.*	2	-	-	-	-	-	-	-	-	-	-	2	-	-	-
					2	-	-	-	-	1	-	2	-	-	-	1.8	-	-	-
BSE 1-2P	FIRST	APPLIED PHYSICS	BES1-2P.1	*Experiment with spectrometer to* ***understand*** *optical phenomenon such as interference and diffraction*	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-
			BES1-2P.2	*Get Acquaint of CRO and its use for engineering Applications*	-		-	-	-	-	-	-	-	-	-	1	-	-	-
					-	2	-	-	-	-	-	-	-	-	-	1	-	-	-
BSE 1 -3P	FIRST	ENERGY AND ENVIRONMENT	BESI-3P.1	*To gain the practical knowledge of handling chemicals.*	2		-	-	-	-	-	-	-	-	-	-	-	-	-
			BESI-3P.2	*Analyzing a broad foundation in energy and environment that stresses scientific reasoning and analytical problem solving with a molecular perspective*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BESI-3P.3	*Experimental techniques using modern instrumentation*	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
					2	2	-	-	2	-	-	-	-	-	-	-	-	-	-
BSE 1-4P	FIRST	COMMUNICATIONS SKILLS	BSE1-4P.1	***Understand*** the importance of listening and overcome listening barriers of communication.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
			BSE1-4P.2	***Enhance and apply*** the knowledge of comprehending skills and speaking skills.	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
			BSE1-4P.3	***Apply*** *the knowledge of effective presentations and handle group situations professionally*	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-

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			BSE1-4P.4	*To **apply** figurative language in their formal as well as informal communication*	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
					-	-	-	-	-	-	-	-	-	2.5	-	-	-	-	-
BSE 1-5P	FIRST	ENGINEERING GRAPHICS	BSE1-5P.1	*Draw the fundamental engineering objects using basic rules and able to construct lines, simple geometries. Construct the various engineering curves using the drawing instruments.*	2	-	2	-	-	-	-	-	-	1	-	1	-	-	-
			BSE1-5P.2	*Draw two dimensional and three dimensional objects, precisely using drawing instruments.*	2	-	2	-	-	-	-	-	-	1	-	1	-	-	-
			BSE1-5P.3	*Draw the development of lateral surfaces for cut section of geometrical solids precisely using drawing instruments.*	2	-	2	-	-	-	-	-	-	1	-	1	-	-	-
			BSE1-5P.4	*Draw simple isometric projection from given orthographic views precisely using drawing instruments.*	2	-	2	-	-	-	-	-	-	1	-	1	-	-	-
					2	-	2	-	-	-	-	-	-	1	-	1	-	-	-
BSE2-1T	SECOND	MATHEMATICS - II	BSE2.1T.1	***Analyze** real world scenarios to recognize when integrals are appropriate, formulate. problems about the scenarios, creatively model these scenarios (using technology, if appropriate) to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2.1T.2	***Define and understand** the geometry of vector differential operators and line and surface integrals.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2.1T.3	***Explain and apply** principles of study design and data collection.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-

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			BSE2.1T.4	***Develop*** *an ability to identify, formulate and/or solve real world problems.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2.1T.5	***Understand*** *the impact of scientific and engineering solutions in a global and societal context.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
BSE2-2T	SECOND	ADCANCED ENGINEERING MATERIALS	BSE2-2T.1	***Learn*** *the concept of formation of energy bands and to classify solids on its basis.*	1	2	-	-	-	-	-	-	-	-	-	1	-	-	-
			BSE2-2T.2	***Identify*** *and explain different types of diodes, transistors and its applications*	2	1	-	-	-	-	-	-	-	-	-	2	-	-	-
			BSE2-2T.3	*Learn the concepts of magnetism and superconductivity, classify and analyze various types o fmagnetic and superconducting materials.*	2	2	-	-	-	-	-	-	-	-	-	1	-	-	-
			BSE2-2T.4	*Learn and explain quantum transitions and apply it to working of lasers.*	2	2	-	-	-	-	-	-	-	-	-	1	-	-	-
			BSE2-2T.5	*Learn the concept of nano materials and compare its properties with those of bulk materials.*	2	2	-	-	-	-	-	-	-	-	-	2	-	-	-
					1.8	1.8	-	-	-	-	-	-	-	-	-	1.4	-	-	-
BSE2-3T	SECOND	APPLIED CHEMISTRY	BES2-3T.1	*To* ***understand*** *the periodic properties and* ***analyze*** *the Microscopic Chemistry in terms of atomic and molecular orbital.*	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-3T.2	*To* ***understand*** *the bulk properties and processes using thermodynamic processes & the causes of corrosion, its consequences and methods to minimize corrosion.*	3		-	-	-	-	-	-	-	-	-	-	-	-	-

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			BES2-3T.3	*To **distinguish** the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.*	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-3T.4	***Apply** the principles of green chemistry in designing alternative reaction methodologies to minimize hazards and environmental degradation.*		3	3	-	-	-	3	-	-	-	-	-	-	-	-
			BES2-3T.5	***Apply** the techniques of water treatment in industrial purposes.*		3	3	-	-	-	-	-	-	-	-	-	-	-	-
					3	3	3	-	-	-	3	-	-	-	-	-	-	-	-
BSE2-4T	**SECOND**	**COMPUTATIONAL SKILLS**	**BSE2-4T.1**	***Understand** the components of a Computer System and to **remember** different hardware and software used in Computer System.*	3	3	-	-		-	-	-	-	-	-	3	-	-	-
			BSE2-4T.2	***Design** an algorithm and **sketch** the flowchart for any problem.*	3	2	2	-	3	-	-	-	-	-	-	1	-	-	-
			BSE2-4T.3	***Apply** the knowledge of fundaments of C language to **Develop** a program.*	2	3	-	-		-	-	-	-	-	-	1	-	-	-
			BSE2-4T.4	***List** and **explain** different searching and sorting techniques for a given set of data.*	3	2	-	-	2	-	-	-	-	-	-	1	-	-	-
			BSE2-4T.5	***Analyze** how exactly the data is stored, organized in memory and **extend** this knowledge to perform operations on the stored data.*	3	1	-	-		-	-	-	-	-	-	1	-	-	-
					2.8	2.2	2	-	2.5	-	-	-	-	-	-	1.4	-	-	-
BSE2-6T	**SECOND**	**BASIC ELECTRICAL ENGINEERING**	**BSE2-6T.1**	***Understand** the basics of electric circuits with reference to Ohms law, Superposition theorem, Types of sources*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2-6T.2	***Understand** the Magnetic circuit*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-

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			BSE2-6T.3	***Understand*** *the AC circuit*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2-6T.4	***Understand*** *the Single phase Transformer, SC-OC test on transformer with no load and on load performance*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
BSE2-7T	SECOND	ENGINEERING MECHANICS	BES2-7T.1	***Find the*** *effect of force and momentum on the body.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-7T.2	***Analyze the effect of system of forces*** *on a given body with the concept of equilibrium and Free body diagram*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-7T.3	***Calculate*** *centroid/C.G. and moments of inertia.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-7T.4	***Solve*** *the problem of connected bodies by virtual work principle*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-7T.5	***Solve*** *the problem of connected bodies by work, energy and D Alembert's principle connected bodies.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-7T.6	***Solve*** *the problem of connected bodies by Impact and Impulse.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
BSE2-8T	SECOND	INDIAN CULTURE & CONSTITUTION	BSE2-8T.1	*Student will become* ***aware*** *of Indian Culture and Civilization and their role in development of society*	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
			BSE2-8T.2	*Students will* ***understand*** *Industrial work culture*	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-
			BSE2-8T.3	*Students will be* ***sensitized*** *towards professional ethics*	-	-	-	-	-	1	1	2	-	-	-	-	-	-	-
			BSE2-8T.4	*Students will* ***understand*** *Indian Constitution and Governance of the country*	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-

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			BSE2-8T.5	*Students will be able to **understand** the structure and system of work organization*	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-
					-	-	-	-	-	1.4	1	2	-	-	-	-	-	-	-
BSE2-5P	SECOND	WORKSHOP PRACTICES	BSE2-5P.1	*Read and Interpret job drawing and plan operation.*	2		-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2-5P.2	*Identify and select proper material, tools ,machines and proper operational parameters*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2-5P.3	*Set tools, work piece and machines for desired operations.*	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-
			BSE2-5P.4	*Complete job of carpentry, Fitting, Welding and Smithy as per job drawing in allotted time.*	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BSE2-5P.5	*Inspect the job for confirm desired dimensions and shape*	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	2	-	-	-	-	-	-	-	-	-	-	-
BSE2-2P	SECOND	ADVANCED ENGINEERING MATERIALS	BES2-2P.1	***Construct** electronic circuit using various components.*		2	-	-	-	-	-	-	-	-	-	1		-	-
			BES2-2P.2	***Develop** the experimental skills and make use of new instruments in Engineering studies.*		2	-	-	-	-	-	-	-	-	-	2		-	-
					-	2	-	-	-	-	-	-	-	-	-	1.5	-	-	-
BSE2-3P	SECOND	APPLIED CHEMISTRY	BES2-3P.1	*Measure molecular/system properties like, concentrations, surface tension, conductance of solutions etc.*	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BES2-3P.1	*Estimate the soluble impurities present in the given water sample.*	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-

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			BES2-3P.1	*Handle the different instruments used in chemistry laboratory.*	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-
					3	-	-	3	3	-	-	-	-	-	-	-	-	-	-
BSE2-3P	SECOND	COMPUTATIONAL SKILLS	BSE2-4P.1	***Understand*** *the components of a Computer System and to* ***remember*** *different hardware and software used in Computer System.*	3	3	-	-	-	-	-	-	-	-	-	3	-	-	-
			BSE2-4P.2	***Demonstrate*** *how to* ***compile*** *and run a program in C Language and* ***Distinguish*** *the compile time and run time errors and* ***modify*** *the code.*	3	2	3	2	-	-	-	-	-	-	-	2	-	-	-
			BSE2-4P.3	***Experiment*** *with various concepts of programming like decision control, looping, strings, arrays, structure and* ***inspect*** *the execution of same.*	3	2	3	3	-	-	-	-	-	-	-	1	-	-	-
			BSE2-4P.4	***Apply*** *the knowledge of fundaments of C language to* ***Develop*** *a program using pointers.*	3	2	3	2	-	-	-	-	-	-	-		-	-	-
			BSE2-4P.5	***Compare*** *the performances of different sorting techniques and different data structures*	3	2	3	3	-	-	-	-	-	-	-	1	-	-	-
					3	2.2	3	2.5	-	-	-	-	-	-	-	1.8	-	-	-
BTME301T	THIRD SEMESTER	MATHEMATICS-III	BTME301T.1	Apply Laplace Transform to solve ordinary differential equations, Integral equations and Integro-differential Equations	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME301T.2	Apply Fourier series in the analysis of periodic functions in terms sine and cosine encountered in engineering problems and Fourier Transform to solve integral equations	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME301T.3	Learn the concept of differentiating, integrating and expanding of analytic functions in complex numbers and their applications such as evaluation of integrals of complex functions	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-

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			BTME301T.4	Solve partial differential equations of first order, higher order with constant coefficients and of second order using method of separation of variables	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**
			BTME301T.5	Analyze real world scenarios to recognize when matrices are appropriate, formulate problems about the scenarios, creatively model these scenarios in order to solve the problems using multiple approaches	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**
					3	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**
BTME302T	**THIRD SEMESTER**	**MANUFACTURING PROCESSES**	**BTME302T.1**	***Understand*** *the importance of manufacturing processes, techniques of pattern making and moulding with their properties. Design gating system along with selection of different types of melting furnaces and special casting process.*	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**
			BTME302T.2	***Get acquainted*** *with the basic concept of joining process, welding process and its types, defects and application.*	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**
			BTME302T.3	***Get acquainted*** *with the forming process for metal, mechanics of forming process along with different types of rolling machine.*	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME302T.4	***Understand and define*** *press working process along with its classification, types and terminology, different types of dies and introduction to shaping operation.*	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME302T.5	***Understand*** *the plastics, ceramics and glasses, its properties, application, forming and its shaping.*	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
					3	**2.8**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**

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BTME302P	THIRD SEMESTER	MANUFACTURING PROCESSES LAB	BTME302P.1	***Think*** *in core concept of their engineering application by studying various topics involved in branch specific applications.*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME302P.2	***Understand*** *the relevance and importance of the Different manufacturing techniques and real life application in industry.*	3	3	2	-	-	-	-	-	-	-	-	-	3	3	2
			BTME302P.3	***Design*** *the gating and riser system needed for casting and requirements to achieve defect free casting.*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME302P.4	***Analyze*** *the welding process behavior and requirements to achieve sound welded joint while welding different similar and dissimilar engineering material*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME302P.5	***Understand*** *the plastic, glass and ceramic Processing*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
					3	3	2	-	-	-	-	-	-	-	-	-	3	3	2
BTEME 303T	THIRD SEMESTER	Fluid Mechanics	BTME 303T.1	*to understand the behavior of fluids at rest or in motion and calculate viscosity*	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME 303T.2	*To measure the pressure using manometer and evaluate the stability and center of pressure*	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME 303T.3	*explain behavior of fluid in motion condition and application of Bernoulli's equation to fluid flow measuring devices.*	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME 303T.4	*To understand and calculate the lift and drag forces in fluid flow field*	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-

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			BTME 303T.5	*apply dimensional analysis to design hydraulic machines and different losses of fluid flow through pipes.*	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
					3	2.2	-	-	-	-	-	-	-	-	-	-	3	-	-
BTME304T	THIRD SEMESTER	Kinematics of Machines	BTME304T.1	***Perform*** *kinematic and dynamic analysis (Displacement, Velocity, acceleration, Inertia forces) of a given mechanism using graphical method*	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
			BTME304T.2	***Understand*** *the concept of compliant mechanisms*	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
			BTME304T.3	***Contrive*** *or* ***synthesize*** *new mechanisms for specific requirements*	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-
			BTME304T.4	***Construct*** *cam profiles and analysis the follower motion.*	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-
			BTME304T.5	***Understand*** *Geometry of gear, its types, analysis of forces and motions of gear teeth.* ***Study*** *of gear trains.*	2	2	-	-	-	-	-	-	-	-	-	-	-	1	-
					2	2	1	-	-	-	-	-	-	-	-	-	-	1	-
BTME305P	THIRD SEMESTER	Machine Drawing & Solid Modelling	BTME305P.1	*Create 2-D orthographic manual drawings as well as digital drawing using CAD software package of standard machine components*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME305P.2	*Apply standard practices for creation of 2-D orthographic manual drawings as well as digital drawing using CAD software package of assembly with dimension detailing, part list and ballooning. Also perform 2-D detailing of assembly components.*	2	2	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME305P.3	*Create 3-D solid model and 2-D detailing of simple parts using CAD software package and perform 2-D detaining.*	3	2	-	-	-	-	-	-	-	-	-	-	3	3	-

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					2.7	2.3	-	-	-	-	-	-	-	-	-	-	3	3	-
BTME306T	THIRD SEMESTER	MATERIAL SCIENCE & ENGINEERING	BTME306T.1	*Student will be capable to **define** microstructure and **analyze** the effect of Crystalline nature of metals, construct and analyze Iron-Iron carbide equilibrium diagram*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BTME306T.2	*Student will be able to **explain** the commercial steels.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BTME306T.3	*Student will be able to **analyze** and **illustrate** suitable heat treatment processes.*	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-
			BTME306T.4	*Student will be able to **analyze** the Cast Iron.*	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-
			BTME306T.5	*Student will be able to **perceive** the basics of powder Metallurgy for powder metallurgical components.*	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	2	-	-	-	-	-	-	-	-	-	-	-
BTME308T	THIRD SEMESTER	Sports	BTME308T.1	*Through sports, students should able to build a wide range of abilities and skills such as leadership, confidence, teamwork, patience, self-reliance, trust, and many more which facilitate the overall development of an individual*															
			BTME308T.2	*Students should learn to manage time between their lectures, sports, and personal life.*															
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTME308T	THIRD SEMESTER	Yoga	BTME308T.1	*To introduce basic wellness principles and practices of Yoga to students*															
			BTME308T.2	*To bring awareness of the fundamentals of Yoga for wellness in their daily lives*															

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			BTME308T.3	*To bring peace and harmony in the society at large by introducing the Yogic way of life.*															
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTME308T	**THIRD SEMESTER**	**NSS**	**BTME308T.1**	*Understand the community in which they work.*															
			BTME308T.2	*Understand themselves in relation to their community.*															
			BTME308T.3	*Identify the needs and problems of the community and involve them in problem-solving.*															
			BTME308T.4	*Develop among them a sense of social and civic responsibility.*															
			BTME308T.5	*Utilize their knowledge in finding practice solutions to individual and community problems.*															
			BTME308T.6	*Develop competence required for group-living and sharing of responsibilities.*															
			BTME308T.7	*Gain skills in mobilizing community participation.*															
			BTME308T.8	*Acquire leadership qualities and democratic attitudes*															
			BTME308T.9	*Develop capacity to meet emergencies and natural disasters.*															
			BTME308T.10	*Practice national integration and social harmony*															
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTME308T	**THIRD SEMESTER**		**BTME308T.1**	*During the training of NCC, candidates should get the basic military training. This training should be conducted to develop the interest of young students in all three forces; the army, the navy and the air force of India. Students should be able to check their abilities to join the Indian Defence Services.*															

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					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTME401T	FOURTH SEMESTER	MACHING PROCESSES	BTME401T.1	***Understand*** *basic cutting tools*	3	2	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401T.2	***Understand*** *the working of lathe and turning operation*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401T.3	***Understand*** *the shaping and planning operation*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401T.4	***Understand*** *the milling and drilling operation*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401T.5	***Understand*** *the grinding and surface finishing*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
					3	2.8	-	-	-	-	-	-	-	-	-	-	3	3	-
BTME401P	FOURTH SEMESTER	MACHING PROCESSES LAB	BTME401P.1	***Understand*** *basic cutting tools*	3	2	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401P.2	***Understand*** *the working of lathe and turning operation*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401P.3	***Understand*** *the shaping and planning operation*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401P.4	***Understand*** *the milling and drilling operation*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME401P.5	***Understand*** *the grinding and surface finishing*	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
					3	2.8	-	-	-	-	-	-	-	-	-	-	3	3	-
BTME402T	FOURTH SEMESTER	Fluid Mechanics & Hydraulic Machines	BTME402T.1	*Classify and explain fluid their properties, fluid in rest condition, types of flow & flow measuring devices and mathematical application of equations on hydraulic components.*	2	-	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.2	*Explain behavior of fluid in motion condition and application of Bernoullie's equation to fluid flow measuring devices.*	2	3	-	-	-	-	-	-	-	-	-	-	3	3	-

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			BTME402T.3	*Apply dimensional analysis to design hydraulic machines and different losses of fluid flow through pipes.*	2	-	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.4	*(i) classify different layout of hydro-electric power plant and (ii) analyze design characteristics of hydraulic machines i.e. turbines (impulse and reaction), Pelton turbine , Francis turbine, propeller turbine and Kaplan turbine*	2		3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.5	*Explain the working principle & design of Centrifugal and reciprocating pump & practical application of similitude & model testing.*	2	2	-	-	-	-	-	-	-	-	-	-	3	3	-
					2	2.5	3	-	-	-	-	-	-	-	-	-	3	3	-
BTME402 P	FOURTH SEMESTER	Fluid Mechanics & Hydraulic Machines Lab	BTME402T.1	*Explain what is Stability condition of floating bodies, Law of conservation of Energy.*	2	-	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.2	*Apply Frictional losses and Hydraulic co-efficient in the pipe flow.*	2	3		-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.3	*Estimate the Performance characteristics of Pelton Turbine*	2	-	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.4	*Estimate the Performance characteristics of Francis Turbine & Kaplan Turbine.*	2	-	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME402T.5	*Estimate the Performance characteristics of Centrifugal Pump & Reciprocating Pump.*	2	2	-	-	-	-	-	-	-	-	-	-	3	3	-
					2	2.5	3	-	-	-	-	-	-	-	-	-	3	3	-
BTME403T	FOURTH SEMESTER	MATERIAL SCIENCE & ENGINEERING	BTME403T.1	*Student will be capable to **define** microstructure and **analyze** the effect of Crystalline nature of metals, construct and analyze Iron-Iron carbide equilibrium diagram*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BTME403T.2	*Student will be able to **explain** the commercial steels.*	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-

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			BTME403T.3	*Student will be able to **analyze** and **illustrate** suitable heat treatment processes.*	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-
			BTME403T.4	*Student will be able to **analyze** the Cast Iron.*	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-
			BTME403T.5	*Student will be able to **perceive** the basics of powder Metallurgy for powder metallurgical components.*		2		2	-	-	-	-	-	-	-	-	-	-	-
					2	2	-	2	-	-	-	-	-	-	-	-	-	-	-
BTME403P	FOURTH SEMESTER	MATERIAL TESTING LAB	BTME403P.1	*Analyze the Microstructure and investigate various properties of ferrorous and Non ferrous Materials . Analyse the stress strain behaviour of materials*	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-
			BTME403P.2	*Analyse the effect of tensile, shearing force and can utilized the gained while tackling real life engineering problems for different types of Materials*	2	2	-	-		-	-	-	-	-	-	-	-	-	-
			BTME403P.3	*Understand Microstructures and their Applications for various uses*		3	-	-	2	-	-	-	-	-	-	-	-	-	-
			BTME403P.4	*Measure torsional strength , hardness of material*	2	2	-	-		-	-	-	-	-	-	-	-	-	-
			BTME403P.5	*Incorporate the various important concepts learnt while designing components*	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-
					2	2.3	2	-	2	-	-	-	-	-	-	-	-	-	-
BTME404T	FOURTH SEMESTER	MECHANICS OF MATERIAL	BTME404T.1	***Demonstrate*** fundamental knowledge about various types of loading and stresses induced	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-
			BTME404T.2	***Develop*** the SFD and BMD for different types of loads and support conditions.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			BTME404T.3	***Estimate*** the strain energy in mechanical elements. And ***analyze*** the deflection in beams	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-

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			BTME404T.4	Can ***design*** shaft for various loading conditions.	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-
			BTME404T.5	***Understand*** theory of failure and effective designing of column and strut.	2	-	2		-	-	-	-	-	-	-	-	-	-	-
					2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
	FOURTH SEMESTER	ENGINEERING THERMODYNAMICS	**CO1**	Understand and ***explain*** gas laws, thermodynamic processes, concept of energy,	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			CO2	***Analyze*** work and heat interactions associated with thermodynamic process	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			CO3	***Define*** first law and second law of thermodynamics and ***apply*** it to thermodynamic systems	-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
			CO4	***Define*** the concept of entropy and ***Evaluate*** the entropy changes in different processes	3		-	-	-	-	-	-	-	-	-	-	3	-	-
			CO5	***Explain*** air standard and vapor power cycles	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
					3	3	2	-	-	-	-	-	-	-	-	-	3	-	-
BTME405P	FOURTH SEMESTER	Computer Application/ Programming	**BTME306P.1**	***Understand*** *and explore concepts in basic programming like data types, input/output functions, operators, programming constructs and user defined functions.*	2	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME306P.2	***Develop*** *capabilities of writing „C" programs in optimized, robust and reusable code*	-	2	2	-	-	-	-	-	-	-	-	-	3	3	-
			BTME306P.3	***Apply*** *appropriate concepts of data structures like arrays, structures implement programs for various applications*	2	-	-	-	2	-	-	-	-	-	-	-	3	3	-
					2	2.5	2	-	2	-	-	-	-	-	-	-	3	3	-

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BTME406T	FOURTH SEMESTER	PROFESSIONAL ETHICS	BTME406T.1	***Understand*** *basic purpose of profession, professional ethics and various moral and social issues*	-	-	-	-	-	2	-	3	-	-	-	-	-	-	3
			BTME406T.2	***Analyze*** *various moral issues and theories of moral development*	-	-	-	-	-	2	-	3	-	-	-	-	-	-	3
			BTME406T.3	***Realize*** *their roles of applying ethical principles at various professional levels*	-	-	-	-	-		-	3	-	-	-	-	-	-	3
			BTME406T.4	***Identify*** *their responsibilities for safety and risk benefit analysis.*	-	-	-	-	-	2	-	-	-	-	-	-	-	-	3
			BTME406T.5	***Understand*** *their roles in dealing various global issues*	-	-	-	-	-	3	2	3	-	-	-	-	-	-	3
					-	-	-	-	-	2.3	2	3	-	-	-	-	-	-	3
BTME501T	FIFTH SEMESTER	Heat Transfer	BTME501T.1	*Define and compare the different modes of heat transfer and calculation of thermal resistance and heat transfer through plane and composite wall, cylinder and sphere with and without thermal contact resistances.*	-	3		-	-	-	-	-	-	-	-	-	3	2	-
			BTME501T.2	*Apply the concept of internal heat generation for the calculation of heat transfer for plane wall, cylinder and sphere and also learn about various types of fins and their significance in steady state conduction heat transfer calculations and -understand the concept of unsteady state heat transfer*	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
			BTME501T.3	*Select and apply appropriate empirical correlations to estimate forced convection and free convection heat transfer, for internal and external flows*	-	-	3	-	-	-	-	-	-	-	-	-	3	2	-

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			BTME501T.4	*Eevaluate heat transfer rate by radiation from ideal and actual surfaces and enclosures of different geometries.*	-	-	3	-	-	-	-	-	-	-	-	-	3	2	-
			BTME501T.5	*Evaluate heat exchanger performance for the given geometry and boundary conditions and design suitable heat exchanger geometry to deliver a desired heat transfer rate.*	-	3		-	-	-	-	-	-	-	-	-	3	-	-
					-	3	3	-	-	-	-	-	-	-	-	-	3	2	-
BTME501P	**FIFTH SEMESTER**	**Heat Transfer Lab**	**BTME501T.1**	*Determine the heat transfer rates through various cross-sections and mediums in different modes.*	-	3		-	-	-	-	-	-	-	-	-	3	-	-
			BTME501T.2	*Acquire, tabulate, analyze experimental data, and draw interpretation and conclusions*	-	-	2	-	-	-	-	-	-	-	-	-	3	-	-
			BTME501T.3	*Calculate radiation heat transfer and utilize that knowledge in designing any heat transfer application .*	-	3		-	-	-	-	-	-	-	-	-	3	-	-
			BTME501T.4	*Eevaluate heat transfer rate by radiation from ideal and actual surfaces and enclosures of different geometries.*		3											3		
			BTME501T.5	*Understand heat exchanger analysis.*		3											3		
					-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
BEETE502T	**FIFTH SEMESTER**	**ENERGY CONVERSION - I**	**BTME502T.1**	***Explain,*** *classify, analyze layout of power plant, cogeneration principle of steam generators (i.e. Boilers), boiler mountings & accessories and evaluate performance parameters of boiler.*	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-
			BTME502T.2	***Explain*** *the concepts of fluidized bed boilers and various draught system and evaluate performance parameters of natural draught system(i.e. chimney)*	-	-	2	-	-	-	-	-	-	-	-	-	-	1	-

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			BTME502T.3	***Explain*** *the importance of steam nozzle and determine its throat area, exit area, exit velocity. Also compare impulse and reaction steam turbines and explain the concept of governing of steam turbine*	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-
			BTME502T.4	***Explain*** *the methods of compounding of steam turbine, various energy losses in steam turbine and able to draw velocity diagrams of steam turbine blades to analyze the angles of the blades, work done, thrust, power, efficiencies of turbine.*	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
			BTME502T.5	***Explain,*** *classify steam condensers, cooling towers and evaluate performance parameters of surface condenser.*	-	3	-	-	-	-	-	-	-	-	-	-	1	-	-
					-	2.7	2	-	-	-	-	-	-	-	-	-	1.3	1.5	-
BTME503T	FIFTH SEMESTER	Design of Machine Element	BTME503T.1	***Apply*** *principals of static loading for design of Cotter joint, Knuckle joint* **.**	3		-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME503T.2	***Design*** *bolted, welded joints, power screws & pressure vessels .*	3	2	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME503T.3	***Design*** *the power transmission shaft & coupling .*	3		-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME503T.4	***Design*** *components subjected to fatigue or fluctuating stresses. Also, will be able to apply principles for determining bending stresses for design of curved beams e.g. crane hook, C-Frame.*	-	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME503T.5	***Design*** *clutches, brakes and springs.*	3		-	-	-	-	-	-	-	-	-	-	3	3	-
					3	2.5	-	-	-	-	-	-	-	-	-	-	3	3	-
BTME504T	FIFTH SEMESTER	INDUSTRIAL ECONOMICS & MANAGEMENT	BTME504T.1	**Understand** the concept of demand and supply and its relationship with the price	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3
			BTME504T.2	**Relate** various factors of production with reference to different economic sectors	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3
			BTME504T.3	**Analyse** the causes and effects of inflation and understand the market structure	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3

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			BTME504T.4	**Acquire** knowledge of various functions of management and marketing management	-	-	-	-	-	3	-	-	3	-	-	-	-	-	3
			BTME504T.5	**Perceive** the concept of financial management for the growth of business	-	-	-	-	-	-	-	-	-	-	3	-	-	-	3
					-	-	-	-	-	3	-	-	3	-	3	-	-	-	3
BTME505T	FIFTH SEMESTER	Mechanical Measurement and Metrology	BTME505T.1	*Students will be able to **analyze** statistical characteristic of systems.*		2	-	-	-	-	-	-	-	-	-	-	-	2	
			BTME505T.2	*Students will be able **asses** the system response.*	2		-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505T.3	*Students will be able to **understand** the instrumentation process.*		2	-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505T.4	*Students will be able to **understand** limits fits and tolerance*	3		-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505T.5	*Students will **learn** the basics of various metrology measurement terms and techniques*	3		-	-	-	-	-	-	-	-	-	-	-	2	-
					2.7	2	-	-	-	-	-	-	-	-	-	-	-	2	-
BTME505P	FIFTH SEMESTER	Mechanical Measurement and Metrology Lab	BTME505P.1	*Students will be able to **perform** the instrumentation.*	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505P.2	*Students will be able to **use** the instrumentation for measurement of thermal properties.*	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505P.3	*Students will be able **obtain** the response from the instruments also can be able to calibrate the instruments.*	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505P.4	*Students will be able to **calculate** the limits and allowances to obtain the proper fit.*	3		-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME505P.5	*Students will able to **identify** the surface roughness using optical flat.*	3		-	-	-	-	-	-	-	-	-	-	-	2	-
					3	2	-	-	-	-	-	-	-	-	-	-	-	2	-

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BTME506T	FIFTH SEMESTER	INDUSTRIAL VISIT (Practice)	ME506T.1	*Opportunity to interact with Industry Experts*	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
			ME506T.2	***Identify** the input and output of the process with Learning experience.*	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-
			ME506T.3	***Extend** their interpersonal skills and communication techniques.*	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
			ME506T.4	***Examine** of industry practices and regulations during industry visits.*	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
			ME506T.5	***Acquire** in depth knowledge about industries & innovative technologies employed.*	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
					2.8	2	-	-	-	-	-	-	-	-	-	-	2.8	-	-
BEMTE507P	FIFTH SEMESTER	PERFORMING ART	BTMET507P.1	An Arts and Science course helps the students to empower themselves with problem solving skills. The ability to analyze things and communicate them in the right way is taught. These skills are very much essential to get employed in reputed companies and most of the companies prefer candidates with the mentioned skills. The students also have a variety of career options to choose for the future	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
					-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
BTME601T	SIXTH SEMESTER	AUTOMATION IN PRODUCTION	BTME601T.1	Get Acquainted With Automation, Its Type's ,Strategies , Assembly Line Balancing And Its Analysis, Methods Of Work Part Transport	2	-	3	-		-	-	-	-	-	-	-	3	3	-
			BTME601T.2	Recognize fundamentals and constructional features of N.C, CNC and D.N.C machines and prepares a CNC program for given part.	-	-	3	-	2	-	-	-	-	-	-	-	3	3	-

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			BTME601T.3	Get Acquainted With The Robotic Configuration, Types Of Links, Joints, Grippers, Industrial Robotics And Robot Applications.	**2**	**3**	**2**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME601T.4	Cultivate Information About Automated Material Handling Systems, Automated Storage And Retrieval System (AGVS,AS/RS) Its Analysis	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME601T.5	Get Acquainted With Automated Inspection (CAPP, CAQC, and CMM) And Group Technology.	**-**	**-**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME601T.6	Recognize CAD/CAM,CIM,FMS, Understand The Concepts Of Shop Floor Control	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
					2.3	**2.5**	**2.3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
BTME601P	**SIXTH SEMESTER**	**AUTOMATION IN PRODUCTION LAB**	**BTME601P.1**	Recognize automation, corroborating this knowledge with case studies on automation systems. study and analyse the material handling systems, robots and GT	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME601P.2	Demonstrate NC programming (manual/apt)	**-**	**-**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME601P.3	Simulate program on CNC milling/ lathe	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME601P.4	Work on CNC milling/ lathe	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
					2.5	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
BEETE602T	**SIXTH SEMESTER**	**Energy Conversion II**	**BTME602T.1**	Classify various types of I.C. Engines and explain the working of its various components and systems.	**3**	**2**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**
			BTME602T.2	Analyze the effect of various operating variables on engine performance		**3**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME602T.3	Understand the working of Gas Turbine and Jet propulsion system		**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**

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			BTME602T.4	Analyze the vapour compression refrigeration system and psychometric process.		3		-	-	-	-	-	-	-	-	-	3	2	-
			BTME602T.5	Understand the working of various types of compressors		3	2	-	-	-	-	-	-	-	-	-	3		-
					3	2.8	2	-	-	-	-	-	-	-	-	-	3	2.5	-
BEETE602P	SIXTH SEMESTER	Energy Conversion II Lab	BTME602P.1	***Identify*** *different components of IC engine, type of compressor , VCR system*	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME602P.2	***Demonstrate*** *and* ***Determine*** *performance of I,C, engine ,compressor and VCR system*	-	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME602P.3	***Construct*** *Heat balance sheet for single/multi cylinder CI and SI engine.*	-	3	2	-	-	-	-	-	-	-	-	-	3	3	-
			BTME602P.4	***Apply*** *Mores Test on Multi cylinder S.I. Engine*	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME602P.5	***Analyze*** *the thermodynamic performance of Gas turbine*	-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
					3	2.8	2	-	-	-	-	-	-	-	-	-	3	3	-
BTME603T	SIXTH SEMESTER	Dynamics of Machines	BTME603T.1	***Comprehend*** *the machine dynamics through basic principles to interpret their application and* ***examine*** *near to life problems due gyroscopic effects and determine the conditions for stability of ships, airplanes and automobile*	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
			BTME603T.2	***Analyze*** *dynamic force conditions in planer linkages and cams to determine required driving torque condition (graphically/ analytically)*	1	1	-	-	-	-	-	-	-	-	-	-	2	-	-
			BTME603T.3	***Estimate*** *the unbalanced forces due to rotating and reciprocating masses in a mechanical system and calculate (graphically/ analytically) the balancing masses required for safe/ smooth operation of these mechanical systems*	1		-	-	-	-	-	-	-	-	-	-	2	-	-

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			BTME603T.4	***Identify*** *the requirement of flywheel, brakes, and dynamometers in a mechanical system and calculate inertia of flywheel and braking condition to be incorporated in engines and machines*	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
			BTME603T.5	***Recognize*** *and* ***interpret*** *the concept of vibration in various mechanical systems and distinguish vibration characteristics for 1 & 2 DOF systems to evaluate the conditions for its control/ use.*	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
					1.6	1.8	-	-	-	-	-	-	-	-	-	-	2	-	-
BTME603P	SIXTH SEMESTER	Dynamics of Machines LAB	BTME603P.1	***Demonstrate*** *the concept of gyroscopic effect through the working model*	2		-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME603P.2	***Analyze*** *the performance of mechanisms and Perform dynamic force analysis of linkages and cams.*	2		-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME603P.3	***Demonstrate*** *record and* ***interpret*** *data of vibration characteristics of mechanical vibratory systems.*	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
			BTME603P.4	***Perform analysis*** *of brakes, dynamometers and flywheels.*	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
			BTME603P.5	***Identify*** *the importance of safety, team work and effective communication for conduction of activity.*	3	3	-	-	-	-	-	-	-	-	-	-		2	-
					2.2	2.3	-	-	-	-	-	-	-	-	-	-	2	2	-
BTME604T	SIXTH SEMESTER	Operations Research	BTME604T.1	***Recognize*** *the importance and value of Operations Research and mathematical modeling in solving practical problems in industry*	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			BTME604T.2	*convert given situation to mathematical form and* ***determine*** *optimal settings*	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
			BTME604T.3	***understand*** *Operations Research models and* ***apply*** *them to real-life problems*	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-

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			BTME604T.4	***manage*** *projects for minimum total cost and smooth level of resources.*	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-
			BTME604T.5	***make*** *decisions related to age of replacement of equipment.*	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
			BTME604T.6	***develop*** *simulation of real life system to* ***analyze*** *and optimize system concerned*	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
					3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
BTME605T	SIXTH SEMESTER	Advance Manufacturing Technique	BTME605T.1	***Define*** and describe the fundamentals and principals of advanced manufacturing processes.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME605T.2	***Apply*** relevant theories to solve manufacturing problems.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME605T.3	***Explain*** manufacturing processes via experimental and theoretical analyses.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME605T.4	***Relate*** manufacturing theory to practice through laboratory experiments.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BTME605T.5	***Improve*** a manufacturing process either working in a team or individually.	3		-	-	-	-	-	-	-	-	-	-	-	3	-
					3	2.7	-	-	-	-	-	-	-	-	-	-	3	2.5	-
BTME606T	SEVENTH SEMESTER	Project evaluation and Management	BTME606T.1	*Utilize the use of a structured approach for each and every unique project undertaken including utilizing project management concepts, tools, and techniques.*															
			BTME606T.2	*Apply participatory methods to project management*															
			BTME606T.3	*Do network scheduling and network planning*															

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			BTME606T.4	*Manage lifecycle on the various phases from project initiation through closure.*															
			BTME606T.5	*Do estimation of project Costs, E V Analysis, Monitoring Project Progress, Project Appraisal.*															
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTME607T	**SIXTH SEMESTER**	**Environment Science**	**BTME607T.1**	*This course provides an integrated and interdisciplinary approach to the study of environment and solutions to environmental problems. This course will spread awareness among the students about environmental issues and shall alert them to find solutions for sustainable development.*															
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTME701T	**SEVENTH SEMESTER**	**COMPUTER AIDED DESIGN**	**BTME701T.1**	*To design graphic system by selecting appropriate input output devices for any graphical applications. Also, develop logic for various geometrical entities used in modelling software by giving appropriate mathematical treatment, put it into an algorithm and convert an algorithm into a computer program.*	**2**	**-**	**2**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME701T.2	*To develop a logic for various transformations on any 2D & 3D geometric objects giving appropriate mathematical treatment, put it into an algorithm and convert an algorithm into a computer program*	**-**	**-**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**
			BTME701T.3	*To Explain the different geometric modelling techniques, synthetic curves & methods of assembly modelling. Also understand parametric representation of space curves and surfaces.*	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**

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			BTME701T.4	*To understand numerical analysis technique called finite element method and apply it on one dimensional problem to determine various field variances.*	-	3	2	-	-	-	-	-	-	-	-	-	3	3	-
			BTME701T.5	*Apply finite element method on truss and beams to determine various fields variances such as nodal displacement, reaction force, element stress etc.*	-	-	2	-	3	-	-	-	-	-	-	-	3	3	-
					2.5	2.5	2.2	-	2.5	-	-	-	-	-	-	-	3	3	-
BEETE702T	SEVENTH SEMESTER	Energy Conversion III	BEETE702T.1	*Analyze the gas turbine and jet propulsion system on varied operating conditions.*	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BEETE702T.2	*Recognize the hydraulic pumps and valves and can able to logically design the hydraulic circuit.*	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			BEETE702T.3	*recognize the air compressors and pneumatic control valves and can able to logically design the pneumatic circuit.*	-	3	-	-	-	-	3	-	-	-	-	-	3	-	-
			BEETE702T.4	*Understand solar power and future opportunities in solar power systems.*	-	3	-	-	2	-	3	-	-	-	-	-	3	-	-
			BEETE702T.5	*Learn the basics of **various** non-conventional energy sources and their applications.*	-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
					-	3	2	-	2	-	3	-	-	-	-	-	3	-	-
BEETE703T	SEVENTH SEMESTER	FINANCE & COST MANAGEMENT	BTME703T.1	*Apply the knowledge of basics of Financial Management concepts and Time Value of Money*	3	2	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME703T.2	*Select, classify, analyze and plan the sources of finance, types of capital, various elements of costs, cost control and evaluate equipment replacement policy, make or buy decisions.*	-	3	-	-	2	-	-	-	-	-	-	-	3	3	-

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			BTME703T.3	*Develop and interpret books of Accounts, Trial Balance, balance Sheet, P&L account, cash flow statement in business*	-	3	2	-	-	-	-	-	-	-	-	-	3	3	-
			BTME703T.4	*Evaluate and examine various Cost of Capital, opportunity cost of capital, Cost of different sources of finance*	-	3		-	-	-	-	-	-	-	-	-	3	3	-
			BTME703T.5	*Evaluate, select and determine various techniques of capital budgeting, profitability index.*	-	3	2	-	-	-	-	-	-	-	-	-	3	3	-
					3	2.8	2	-	2	-	-	-	-	-	-	-	3	3	-
BTME704T	SEVENTH SEMESTER	DESIGN OF TRANSMISSION SYSTEM	BTME704T.1	***Design** journal and thrust bearings and selection of standard rolling contact bearings*	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME704T.2	***Design** flexible transmission drives like belts, chains and rope.*	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME704T.3	***Design** the positive transmission drives like gears as spur and Helical Gear.*	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME704T.4	***Design** the positive transmission drives like gears as worm and Bevel Gears*	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
			BTME704T.5	***Design** the energy storing components like Flywheels for various applications.*	3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
					3	3	3	-	-	-	-	-	-	-	-	-	3	3	-
BTME705P	SEVENTH SEMESTER	SUMMER INTERNSHIP	BTME705T.1	*Internships provide exposure to the real world*	2		-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME705T.2	*Internships give a platform to establish critical networking connections*	2	3	-	-	-	-	-	-	-	-	-	-	-	-	2
			BTME705T.3	*Internships allow to learn more about yourself*	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2

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			BTME705T.4	*Internships equip with more than just technical skills*	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
			BTME705T.5	*Internships allow to gain a competitive edge*	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
					2	3	-	-	-	-	-	-	-	-	-	-	-	2	2
BTME801T	EIGHTH SEMESTER	Industrial Engineering	BTME801T.1	*Understand the concept of Management & Principles*	3	2	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME801T.2	*Understanding Human Behavior, Laws , Training & Development*	-	2	-	-	3	-	-	-	-	-	-	-	3	3	-
			BTME801T.3	*Understanding Markets, its Behavior, Product & its promotion & its life cycle*	-	3	2	-	-	-	-	-	-	-	-	-	3	3	-
			BTME801T.4	*Understanding Finance, Cost, importance of Balance sheet, P& L statement*	-	3	-	-	-	-	-	-	-	-	-	-	3	3	-
			BTME801T.5	*Understanding Industries and importance of layouts, equipment , tools & Techniques*		3	2	-	-	-	-	-	-	-	-	-	3	3	-
			BTME801T.6	*Understanding Production Quality tools & Techniques*	3		3	-	-	-	-	-	-	-	-	-	3	3	-
					3	2.6	2.3	-	3	-	-	-	-	-	-	-	3	3	-
BTME801P	EIGHTH SEMESTER	Industrial Engineering LAB	BTME805T.1	*Convert their conceptual ideas into working projects.*															
			BTME805T.2	*Explore the possibility of publishing papers in journal*															
			BTME805T.3	*Enhance their knowledge through **an** on-line collection of evidence, work and other information.*															

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			BTME805T.4	*Ultimately promotes for inter-personal communication, punctuality, demonstration of appropriate written and oral communication skills with overall Work-Integrated-learning*															
			BTME805T.5	*Develop an understanding of social, cultural, professional, ethical, global and environmental responsibilities of the professional Engineer.*															
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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