DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOMES (COS) OF ALL COURSES FRAMED UNDER

JNTUA-R19 REGULATION

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S.No	Course Code	Course Name	Year & Sem
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S.No	Course Code	Course Name	Year & Sem
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1st btech 1st sem

COURSE NAME: Algebra & Calculus

COURSE CODE: 19A54101

CO No.	COURSE OUTCOME
4101:1	solving systems of linear equations, using technology to facilitate row reduction determine the rank, eigenvalues and eigenvectors, diagonal form and different factorizations of a matrix; (L3)
4101:2	Translate the given function as series of Taylor's and Maclaurin's with remainders (L3)

4101:3	Find partial derivatives numerically and symbolically and use them to analyze and interpret the way a function varies. (L3)
4101:4	Evaluate double integrals of functions of several variables in two dimensions using Cartesian and polar coordinates (L5)
4101:5	understand beta and gamma functions and its relations (L2)

COURSE NAME: Engineering Chemistry

COURSE CODE: 20A51101T

CO No.	COURSE OUTCOME
1101T:1	Discuss the MOT, Apply Schrodinger wave equation to H. (BTL3)
1101T:2	Demonstrate the application of Fullerene, CNT and Nanoparticles(BTL2)
1101T:3	Differentiate between pH metry, Potentiometry (BTL2)
1101T:4	Discuss BUNA-S and BUNA-N Elastromers (BTL2)
1101T:5	Understand the principles of analytical instruments (BTL2)

COURSE NAME: Probability and Statistics

COURSE CODE: 19A54202

CO No.	COURSE OUTCOME
4202:1	make use of the concepts of probability and their applications (L3)

4202:2	apply discrete and continuous probability distributions (L3
4202:3	classify the concepts of data science and its importance (L4)
4202:4	interpret the association of characteristics and through correlation and regression tools (L4)
4202:5	design the components of a classical hypothesis test (L6)

COURSE NAME: ENGINEERING GRAPHICS LAB

COURSE CODE: 19A03102

CO No.	COURSE OUTCOME
3102:1	Use computers as a drafting tool. (BTL2)
3102:2	Draw isometric and orthographic drawings using CAD packages. (BTL3)
3102:3	Analysing 3dimentional objective(BTL4)

COURSE NAME: ENGINEERING WORKSHOP

COURSE CODE: 20A03202

CO No.	COURSE OUTCOME
3202:1	Apply wood working skills in real world applications.[BTL3]
3202:2	Build different parts with metal sheets in real world applications. [BTL3]
3202:3	Apply fitting operations in various applications. [BTL3]
3202:4	Apply different types of basic electric circuit connections.[BTL3]

3202:5	Preparation of moulds and castings.[BTL3]

COURSE NAME: ENGINEERING CHEMISTRY LAB

COURSE CODE: 20A51101P

CO No.	COURSE OUTCOME
1101P:1	Determine the cell constant and conduct of the solutions.(BTL3)
1101P:2	Estimate the ferrous iron and Strength of an acid in battery. (BTL2)
1101P:3	Prepare the advanced materials and analyse the properties. (BTL3)
1101P:4	Analyse the IR and NMR spectroscopy. (BTL3)
1101P:5	Analyse the saperation method of HPLC and TLC (BTL3)

COURSE NAME: Problem Solving and Programming Lab

COURSE CODE: 19A05101P

CO No.	COURSE OUTCOME
CO:1	Construct a Computer given its parts (L6)
CO:2	Select the right control structure for solving the problem (L6)
CO:3	Analyze different sorting algorithms (L4)
CO:4	Design solutions for computational problems (L6)
CO:5	Develop C programs which utilize the memory efficiently using programming constructs like pointers.

1ST BTECH.IIND SEM

COURSE NAME: BASIC ELECTRICAL & ELECTRONICS ENGINEERING

COURSE CODE: 19A02201T

CO No.	COURSE OUTCOME
2201T:1	Understand working operation of various generating stations (L2)
2201T:2	Explain the types of Distribution systems
2201T:3	Describe basic elements of a communication system (L2)
2201T:4	Understand functioning of various communication systems (L2)
2201T:5	Explain need for modulation and different modulation techniques (L2)

COURSE NAME: DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

COURSE CODE: 19A54201

CO No.	COURSE OUTCOME
4201:1	solve the differential equations related to various engineering fields (L6) • • •
4201:2	Identify solution methods for partial differential equations that model physical processes (L3)
4201:3	interpret the physical meaning of different operators such as gradient, curl and divergence (L5)
4201:4	estimate the work done against a field, circulation and flux using vector calculus (L6)

COURSE NAME: ENGINEERING PHYSICS

COURSE CODE: 19A56102T

CO No.	COURSE OUTCOME
6102T:1	Explain physics applied to solve engineering problems (L2)
6102T:2	Apply the principles of acoustics in designing of buildings (L3)
6102T:3	Explains the applications of ultrasonics in various engineering fields (L2)
6102T:4	Apply electromagnetic wave propagation in different Optical Fibers (L2)
6102T:5	Apply the lasers concepts in various applications (L3)
6102T:6	Explains the concepts of dielectric and magnetic materials (L2)

COURSE NAME: DATA STRUCTURES

COURSE CODE: 19A05201T

CO No.	COURSE OUTCOME
5201T:1	Select Appropriate Data Structure for solving a real world problem (L4) 2. 3. 5.
5201T:2	Select appropriate file organization technique depending on the processing to be done (L4)
5201T:3	Construct Indexes for Databases (L6) 4. Analyse the Algorithms (L4)
5201T:4	Develop Algorithm for Sorting large files of data (L3)

COURSE NAME: COMMUNICATIVE ENGLISH I

COURSE CODE: 19A52101T

CO No.	COURSE OUTCOME

2101T:1	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
2101T:2	Apply grammatical structures to formulate sentences and correct word forms
2101T:3	Analyze discourse markers to speak clearly on a specific topic in informal discussions
2101T:4	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
2101T:5	Create a coherent paragraph interpreting a figure/graph/chart/table

COURSE NAME: COMMUNICATIVE ENGLISH I LAB

COURSE CODE: 19A52101P

CO No.	COURSE OUTCOME
2101P:1	To remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills
2101P:2	To apply communication skills through various language learning activities
2101P:3	To analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension
2101P:3	To evaluate and exhibit acceptable etiquette essential in social and professional settings
2101P:5	To create awareness on mother tongue influence and neutralize it in order to improve fluency in spoken English.

COURSE NAME: MECHANICAL ENGINEERING WORKSHOP

COURSE CODE: 19A03201

CO No.	COURSE OUTCOME
3201:1	make moulds for sand casting. (L3)
3201:2	develop different weld joints. (L3)

3201:3	assemble or disassemble of machine components. (L3)
3201:4	use power tools for different applications. (L3)
3201:5	make plastic components. (L3)
3201:6	Assemble computer and installation of software (L3)

COURSE NAME: BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

COURSE CODE: 19A02201P

CO No.	COURSE OUTCOME
2201P:1	Verify Kirchoff's Laws & Superposition theorem.
2201P:2	Perform testing on AC and DC Machines.
2201P:3	Study I – V Characteristics of PV Cell
2201P:4	Describe construction, working and characteristics of diodes, transistors and operational amplifiers (L2)
2201P:5	Demonstrate how electronic devices are used for applications such as rectification, switching and amplification (L2)
2201P:6	Build different building blocks in digital electronics using logic gates (L3)
2201P:7	Explain functionality of flip-flops, shift registers and counters for data processing applications (L2)

COURSE NAME: ENGINEERING PHYSICS LAB

COURSE CODE: 19A56102P

CO No.	COURSE OUTCOME
6102P:1	Operate various optical instruments (L2)
6102P:2	Estimate wavelength of laser and particles size using laser(L2)

6102P:3	estimate the susceptibility and related magnetic parameters of magnetic materials (L2)
6102P:4	plot the intensity of the magnetic field of circular coil carrying current with distance (L3)
6102P:5	evaluate the acceptance angle of an optical fiber and numerical aperture (L3)
6102P:6	determine magnetic susceptibility of the material and its losses by B-H curve (L3)
6102P:7	identify the type of semiconductor i.e., n-type or p-type using hall effect (L3)
6102P:8	Apply the concepts of sensors for various applications (L2)
6102P:9	Apply the concepts of sensors for various applications (L2)
6102P:10	Apply the concepts of sensors for various applications (L2)

COURSE NAME: DATA STRUCTURES LAB

COURSE CODE: 19A05201P

CO No.	COURSE OUTCOME
5201P:1	Select the data structure appropriate for solving the problem (L5)
5201P:2	Implement searching and sorting algorithms (L3)
5201P:3	Design new data types (L6)
5201P:4	Illustrate the working of stack and queue (L4)
5201P:5	Organize the data in the form of files (L6)

IIND BTECH.IST SEM

COURSE NAME: COMPLEX VARIABLES, TRANSFORMS & PARTIAL DIFFERENTIAL EQUATIONS

COURSE CODE: 19A54301

CO No.	COURSE OUTCOME
4301:1	Understand the analyticity of complex functions and conformal mappings.
4301:2	Apply Cauchy's integral formula and Cauchy's integral theorem to evaluate improper integrals along contours.
4301:3	Understand the usage of Laplace Transforms.
4301:4	Evaluate the Fourier series expansion of periodic functions.
4301:5	Formulate/solve/classify the solutions of Partial differential equations and also find the solution of one dimensional wave equation and heat equation.

COURSE NAME: PYTHON PROGRAMMING

COURSE CODE: 19A05304T

CO No.	COURSE OUTCOME
5304T:1	. Apply the features of Python language in various real applications.
5304T:2	Select appropriate data structure of Python for solving a problem
5304T:3	Design object oriented programs using Python for solving real-world problems.
5304T:4	Apply modularity to programs.

COURSE NAME: MANUFACTURING PROCESSES

COURSE CODE: 19A03301T

CO No.	COURSE OUTCOME

3301T:1	Demonstrate different metal casting processes and gating systems. (L2)
3301T:2	Classify working of various welding processes. (L2)
3301T:3	Evaluate the forces and power requirements in rolling process. (L5)
3301T:4	Apply the principles of various forging operations. (L3)
3301T:5	Outline the manufacturing methods of plastics, ceramics and powder metallurgy. (L1)

COURSE NAME: ENGINEERING MECHANICS

COURSE CODE: 19A03302

CO No.	COURSE OUTCOME
3302:1	Resolve forces and couples in mechanical systems. (L3)
3302:2	Identify the frictional forces and its influence on equilibrium. (L3)
3302:3	Find the centre of gravity and moment of inertia for various geometric shapes (L3)
3302:4	Develop equations for different motions. (L4)
3302:5	Determine the displacement, velocity and acceleration relations in dynamic systems (L4)

COURSE NAME: MATERIAL SCIENCE AND ENGINEERING

COURSE CODE: 19A03303T

CO No.	COURSE OUTCOME
3303T:1	Explain the principles of binary phases. (L2)

3303T:2	Select steels and cast irons for a given application. (L3)
3303T:3	Apply heat treatment to different applications. (L3)
3303T:4	Utilize nonferrous metals and alloys in engineering. (L3)
3303T:5	Choose composites for various applications. (L3)

COURSE NAME: DESIGN THINKING AND PRODUCT INNOVATION

COURSE CODE: 19A99303T

CO No.	COURSE OUTCOME
9303T:1	summarize the importance of basic sciences in product development (L2)
9303T:2	explain the historical developments in mechanical, electrical, communications and computational engineering (L3)
9303T:3	apply systematic approach to innovative designs (L3)
9303T:4	identify new materials and manufacturing methods in design (L3)

COURSE NAME: UNIVERSAL HUMAN VALUES

COURSE CODE: 19A52301

CO No.	COURSE OUTCOME
2301:1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
2301:2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and

	human nature in mind.
2301:3	They would have better critical ability
2301:4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
2301:5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction

COURSE NAME: DESIGN THINKING AND PRODUCT INNOVATION LAB

COURSE CODE: 19A99303P

CO No.	COURSE OUTCOME
9303P:1	To develop 3D models using 3D printing
9303P:2	To design the system with measuring devices
9303P:3	Design hydraulic / pneumatic circuits

COURSE NAME: MANUFACTURING PROCESSES LAB

COURSE CODE: 19A03301P

CO No.	COURSE OUTCOME
3301P:1	Fabricate different types of components using various manufacturing techniques. (L6)
3301P:2	Adapt unconventional manufacturing methods. (L6)

COURSE OUTCOMES

COURSE NAME: MATERIAL SCIENCE & ENGINEERING LAB

COURSE CODE: 19A03303P

CO No.	COURSE OUTCOME
3303P:1	Identify various microstructures of ferrous and non-ferrous metals and alloys. (L3)
3303P:2	Visualize grains and grain boundaries. (L3)
3303P:3	Importance of hardening of steels. (L2)
3303P:4	Evaluate hardness of treated and untreated steels. (L4)

COURSE NAME: ENVIRONMENTAL SCIENCE

COURSE CODE: 19A99301

CO No.	COURSE OUTCOME
9301:1	Grasp multidisciplinary nature of environmental studies and various renewable and nonrenewable resources.
9301:2	Understand flow and bio-geo- chemical cycles and ecological pyramids.
9301:3	Understand various causes of pollution and solid waste management and related preventive measures.
9301:4	About the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.
9301:5	Casus of population explosion, value education and welfare programmes.

2ND BTECH.2ND SEM

COURSE NAME: Numerical Methods & Probability Theory

COURSE CODE: 19A54304

CO No.	COURSE OUTCOME
4304:1	Apply numerical methods to solve algebraic and transcendental equations [L2]
4304:2	Derive interpolating polynomials using interpolation formulae [L2]
4304:3	Solve differential and integral equations numerically [L2]
4304:4	Apply Probability theory to find the chances of happening of events[L2]
4304:5	Understand various probability distributions and calculate their statistical constants.[L2]

COURSE NAME: Thermodynamics

COURSE CODE: 19A03401

CO No.	COURSE OUTCOME
3401:1	Understand the importance of thermodynamic properties related to conversion of heat energy into work. (BTL1)
3401:2	Apply the laws of thermodynamics to boilers, heat pumps, refrigerators, heat engines, compressors and nozzles. (BTL3)
3401:3	Utilize steam properties to design steam based components (BTL4)
3401:4	Introduce the concept of available energy for maximum work conversion. (BTL5)
3401:5	Analyze thermodynamic relations and air standard cycles (BTL4)

COURSE NAME: MECHANICS OF MATERIALS

COURSE CODE: 19A03402T

CO No.	COURSE OUTCOME

CO No.	COURSE OUTCOME
3402T:1	Evaluate stresses and strains (BTL5)
3402T:2	To draw the SF and BM diagrams for various beams under different loading conditions(BTL4)
3402T:3	Determine the resistance and deformation in machine members subjected to torsional loads and springs(BTL2)
3402T:4	Analyze and design thin, thick cylinders. (BTL4)
3402T:5	Analysis of stresses in curved bars. (BTL4)

COURSE NAME: Fluid Mechanics & Hydraulic Machines

COURSE CODE: 19A01407

CO No.	COURSE OUTCOME
1407:1	Familiarize basic terms used in fluid mechanics (BTL1).
1407:2	Understand the principles of fluid statics, kinematics and dynamics (BTL1)
1407:3	Understand flow characteristics and classify the flows and estimate various losses in flow through channels (BTL1)
1407:4	Analyze characteristics for uniform and non-uniform flows in open channels (BTL4)
1407:5	Design different types of turbines, centrifugal and multistage pumps. (BTL4)

COURSE NAME : INTERNET OF THINGS

COURSE CODE: 19A05406T

CO No.	COURSE OUTCOME
5406T:1	Choose the sensors and actuators for an IoT application (BTL1)

5406T:2	Select protocols for a specific IoT application (BTL2)
5406T:3	Utilize the cloud platform and APIs for IoT applications (BTL3)
5406T:4	Experiment with embedded boards for creating IoT prototypes (BTL3)
5406T:5	Design a solution for a given IoT application (BTL6)

COURSE NAME: KINEMATICS OF MACHINERY

COURSE CODE: 19A03403

CO No.	COURSE OUTCOME
3403:1	An understanding of concepts of different of mechanism with lower pairs and higher pairs.(BTL1)
3403:2	Gain the knowledge of different types of straight line motion mechanism and steering gear mechanisms.(BTL6)
3403:3	Obtain an in depth knowledge of finding displacement, velocity and acceleration of different points on different mechanisms using different methods(relative velocity, Instantaneous methods(BTL3)
3403:4	Acquire the knowledge on different gear profiles and calculating the different parameters of gears. (BTL3)
3403:5	Design and analyze different cam profile for different types of followers and various gear trains.(BTL3) .

COURSE NAME: Computer Aided Machine Drawing

COURSE CODE: 19A03404

CO No.	COURSE OUTCOME
3404:1	Demonstrate the conventional representations of materials and machine components. (BTL2)
3404:2	Model riveted, welded and key joints using CAD system. (BTL4) Create solid models and sectional views of machine components. (BTL6)

3404:3	Generate solid models of machine parts and assemble them. (BTL6)
3404:4	Translate 3D assemblies into 2D drawings. (BTL4)
3404:5	Create manufacturing drawing with dimensional and geometric tolerances. (BTL6)

COURSE NAME: Mechanics of Materials Lab

COURSE CODE: 19A03402P

CO No.	COURSE OUTCOME
3402P:1	Understand the stress-strain behaviour of different materials.(BTL2)
3402P:2	Identify the difference between compression and tension testing.(BTL1)
3402P:3	Evaluate the hardness of different materials.(BTL5)
3402P:4	Correlate the elastic constants of the materials. .(BTL2)
3402P:5	Understand the stress-strain behaviour of different materials.(BTL2)

COURSE NAME: BIOLOGY FOR ENGINEERS

COURSE CODE: 19A99302

CO No.	COURSE OUTCOME
9302:1	Explain about cells and their structure and function. Different types of cells and basics for classification of living Organisms.
9302:2	Explain about biomolecules, their structure and function and their role in the living organisms. How biomolecules are useful in Industry

9302:3	Briefly about human physiology.
9302:4	Explain about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms
9302:5	Know about application of biological Principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic microbes, plants and animals.

3RD BTECH 1ST SEM

COURSE NAME: Applied Thermodynamics

COURSE CODE: 19A03501T

CO No.	COURSE OUTCOME
3501T:1	To understand the Working Principles of I.C. engines. (BTL2)
3501T:2	To teach combustion process in SI and CI engines. (BTL4)
3501T:3	To introduce different types of compressors. (BTL5)
3501T:4	To familiarize concepts of thermodynamic cycles used in steam power plants and gas turbines (BTL5)
3501T:5	To impart knowledge on the working of nozzles, turbines, refrigeration and air conditioning. (BTL4)

COURSE NAME: : MANUFACTURING TECHNOLOGY

COURSE CODE: 19A03502T

CO No.	COURSE OUTCOME
3502T:1	Choose cutting processes and variables. (l3) .Relate tool wear and tool life. (BTl1)

3502T:2	Calculate the machining parameters for different machining processes. (BTl5)
3502T:3	Identify methods to generate different types of surfaces. (BTl3)
3502T:4	Explain work-holding requirements. (BTl2)
3502T:5	Design jigs and fixtures. (BTl6)

COURSE NAME: Heat transfer

COURSE CODE: 19A03503T

CO No.	COURSE OUTCOME
3503T:1	To impart the basic laws of conduction, convection and radiation heat transfer and their applications (BTL2)
3503T:2	To familiarize the convective heat transfer concepts (BTL4)
3503T:3	To explain basics of radiation heat transfer (BTL5)
3503T:4	To make conversant with the heat transfer analysis related to thermal systems like heat exchangers, evaporator, and condenser. (BTL5)
3503T:5	To understand the phenomenon of boiling and condensation to familiarize the mass transfer process (BTL4)

COURSE NAME: Dynamics of Machinery

COURSE CODE: 19A03505

CO No.	COURSE OUTCOME
3505:1	Understand the effect of reactive gyroscopic couple on the stability of vehicles (BTL2)

3505:2	Understand the power lost and power transmitted due to friction (BTL2)
3505:3	Identify and correct the unbalances of rotating body (BTL1)
3505:4	Reduce the magnitude of vibration and isolate vibration of dynamic systems. (BTL1)
3505:5	Determine dimensions of Governors for speed control .(BTL1)

COURSE NAME: AUTOMOBILE ENGINEERING

COURSE CODE: 19A03504a

CO No.	COURSE OUTCOME
3504a:1	Illustrate working of IC engine components.(BTL1)
3504a:2	Analyze the combustion phenomenon in S.I and C.I engines and various emission control methods..(BTL1)
3504a:3	Explain various elements and transmission system of an automobile.(BTL2)
3504a:4	Explain, steering and suspension systems of an automobile.(BTL6)
3504a:5	Describe the importance of safety systemand hybrid vehicle.(BTL2)

COURSE NAME: Technical Communication and Presentation Skills

COURSE CODE: 19A52506a

CO No.	COURSE OUTCOME
2506a:1	To Understand the importance of effective technical communication[BTL2]
2506a:2	To Apply the knowledge of basic skills to become good orators[BTL3]
2506a:3	To Analyze non-verbal language suitable to different situations in

CO No.	COURSE OUTCOME
2506a:4	To Evaluate different kinds of methods used for effective presentations[BTL5]
2506a:5	To Create trust among people and develop employability skills[BTL5]

COURSE NAME: Technical Communication and Presentation Skills

COURSE CODE: 19A52506a

CO No.	COURSE OUTCOME
2506a:1	To Understand the importance of effective technical communication[BTL2]
2506a:2	To Apply the knowledge of basic skills to become good orators[BTL3]
2506a:3	To Analyze non-verbal language suitable to different situations in professional life[BTL4]
2506a:4	To Evaluate different kinds of methods used for effective presentations[BTL5]
2506a:5	To Create trust among people and develop employability skills[BTL5]

COURSE NAME: Technical Communication and Presentation Skills

COURSE CODE: 19A52506a

CO No.	COURSE OUTCOME
2506a:1	To Understand the importance of effective technical communication[BTL2]
2506a:2	To Apply the knowledge of basic skills to become good orators[BTL3]
2506a:3	To Analyze non-verbal language suitable to different situations in professional life[BTL4]

2506a:4	To Evaluate different kinds of methods used for effective presentations[BTL5]
2506a:5	To Create trust among people and develop employability skills[BTL5]

COURSE NAME: FLUID MECHANICS AND HYDRAULIC MACHINES LAB

COURSE CODE: 19A03403P

CO No.	COURSE OUTCOME
3403P:1	By performing the various tests in this laboratory the student will be able to know the principles of discharge measuring devices and head loss due to sudden contraction and expansion in pipes and working principles of various pumps and motors. **(BTL1).**
3403P:2	Understand the bernoulis theorem (BTL2)
3403P:3	Analysize hydraulic machines (BTL13)
3403P:4	By performing the various tests in this laboratory the student will be able to know the principles of discharge measuring devices and head loss due to sudden contraction and expansion in pipes and working principles of various pumps and motors. **(BTL1).**
3403P:5	Understand the bernoulis theorem (BTL2)

COURSE NAME: CONSTITUTION OF INDIA

COURSE CODE: 19A99501

CO No.	COURSE OUTCOME
9501:1	Understand historical background of the constitution making and its importance for building a democratic India.
9501:2	Understand the value of the fundamental rights and duties for becoming

	good citizen of India.
9501:3	Understand the value of the fundamental rights and duties for becoming good citizen of India.
9501:4	Analyze the decentralization of power between central, state and local selfgovernment
9501:5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.
9501:6	Understand the functioning of three wings of the government ie., executive, legislative and judiciary.

IIIRD BTECH.1IND SEM

COURSE NAME: DME

COURSE CODE: 19A03601

CO No.	COURSE OUTCOME
3601:1	Provide an introduction to design of machine elements.
3601:2	Familiarize with fundamental approaches to failure prevention for static and dynamic loading.
3601:3	Explain design procedures to different types of joints.
3601:4	Teach principles of clutches and brakes and design procedures.
3601:5	Instruct different types of bearings and design procedures.

COURSE NAME: CAD/CAM

COURSE CODE: 19A03602T

CO No.	COURSE OUTCOME
3602T:1	Apply various transformations to manipulate a geometric model (BTL3)
3602T:2	Illustrate various entities of wire frame, surface, and solid models (BTL1)
3602T:3	Develop the CNC part programming for given component. (BTL2)
3602T:4	Develop manual and computer aided part programming for turning and milling operations. (BTL3)
3602T:5	Summarize the principles of robotics AR,VR and AI in CIM. (BTL2)

COURSE NAME: ENGLISH LANGUAGE SKILLS

COURSE CODE: 19A52601T

CO No.	COURSE OUTCOME
2601T:1	Understand the purpose of rhythm and rhyme making the presentation lively and attractive. BL-2
2601T:2	Apply the knowledge of structure and style in a presentation, identify the audience and make note of key points. BL-3
2601T:3	Evaluate reading/Listening texts and to write summaries based on global comprehension of these texts. BL-5
2601T:4	Express thoughts and ideas with acceptable accuracy and fluency. BL-1
2601T:5	Create a coherent paragraph interpreting figure/graph/chart/table BL-4

COURSE NAME: FUNDAMENTALS OF ADDITIVE MANUFACTURING

COURSE CODE: 19A03603b

CO No.	COURSE OUTCOME
3603b: 1	To introduce students the basics of additive manufacturing/rapid prototyping anditsapplicationsinvarious fields,reverseengineeringtechniques..(BTL2)
3603b: 2	Tofamiliarizestudentswithdifferentprocessesinrapidprototypingsystems.(BTL3)
3603b: 3	To teach students About mechanical properties and geometric issues relating to specific rapid prototyping applications..(BTL2)
3603b: 4	DemonstratetheknowledgeofAdditiveManufacturingandRapidPrototypingtechnologies. (BTL3
3603b: 5	To understand the performance describe different RP techniques. (BTL2)

COURSE NAME: DATA SCIENCE

COURSE CODE: 19A05604b

CO No.	COURSE OUTCOME
5604b:1	Visualize the data using bar charts, line charts and scatter plots (BTL4)
5604b:2	Analyze Correlation between two data objects (BTL4)
5604b:3	Solve decision making problems using k-NN, Naïve Bayes, SVM and Decision. Trees (BTL3).
5604b:4	Determine Clusters in data using k-means and Hierarchical Clustering methods (BTL3)
5604b:5	Demonstrate the way to use machine learning algorithms using python. (BTL2)

COURSE NAME: SUPPLY CHAIN MANAGEMENT

COURSE CODE: 19A52602E

CO No.	COURSE OUTCOME
2602E:1	Understand the concept of logistics and supply chain management
2602E:2	Design a distribution network
2602E:3	Get the inputs of supply chain Analysis and design collaboration
2602E:4	Apply the techniques of logistics system and Demand Management.
2602E:5	Know the recent trends in supply chain management and Green Supply Chain Management

COURSE NAME: Heat Transfer Lab

COURSE CODE: 19A03503P

CO No.	COURSE OUTCOME
3503P:1	To Understand different modes of heat transfer (BTL1)
3503P:2	To evaluate thermal conductivities of different materials (BTL4)
3503P:3	To Gain knowledge about natural and force convection phenomenon (BTL5)
3503P:4	Estimate experimental uncertainty in measurements (BTL5)
3503P:5	To Understand different modes of heat transfer (BTL1)

COURSE NAME: ENGLISH LANGUAGE SKILLS LAB

COURSE CODE: 19A52601P

CO No.	COURSE OUTCOME

2601P:1	Remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills[BTL1]
2601P:2	Apply communication skills through various language learning activities[BTL2]
2601P:3	Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension. [BTL4]
2601P:4	Evaluate and exhibit acceptable etiquette essential in social and professional settings.[BTL6]
2601P:5	Create awareness on mother tongue influence and neutralize it in order to improve fluency in spoken English.[BTL6]

IV BTECH.1ST SEM

COURSE NAME: OPERATIONS RESEARCH

COURSE CODE: 19A03701

CO No.	COURSE OUTCOME
3701:1	Develop mathematical models for practical problems. (l3)
3701:2	Apply linear programming to transportation problems. (l3)
3701:3	Solve games using various techniques. (l3)
3701:4	Solve production scheduling and develop inventory policies. (l6
3701:5	Apply optimality conditions for constrained and unconstrained nonlinear problems. (l3)
3701:6	apply dynamic programming methods. (L3)

COURSE NAME: METROLOGY AND MEASUREMENTS

COURSE CODE: 19A03702T

CO No.	COURSE OUTCOME

3702T:1	List various measuring instruments used in metrology. (L4)
3702T:2	Examine geometry of screw threads and gear profiles. (L4)
3702T:3	Measure force, torque, temperature, pressure and sound. (L5)
3702T:4	Calibrate various measuring instruments. (L4)

COURSE NAME: AUTOMOTIVE TRANSMISSION SYSTEM

COURSE CODE: 19A03703a

CO No.	COURSE OUTCOME
3703a:1	Understand the working principles of clutches and gearboxes
3703a:2	Analyze the working of planetary gear box systems.
3703a:3	Identify the differences between the hydrostatic and hydrodynamic drives
3703a:4	Discuss various types of automatic transmission systems
3703a:5	Design the automatic transmission system.

COURSE NAME: RENEWABLE ENERGY SYSTEMS

COURSE CODE: 19A02704a

CO No.	COURSE OUTCOME
2704a:1	To distinguish between various alternate sources of energy for different suitable application requirements
2704a:2	To differentiate between solar thermal and PV system energy generation strategies
2704a:3	To understand about wind energy system

2704a:4	To get exposed to the basics of Geo Thermal Energy Systems
2704a:5	To know about various diversified energy scenarios of ocean, biomass and fuel cells

COURSE NAME: Management Science

COURSE CODE: 19A52701b

CO No.	COURSE OUTCOME
2701b:1	Understand the concepts & principles of management and know the designs of organizational structures. (BTL2)
2701b:2	Apply the knowledge of Work-study principles & Quality Control techniques. (BTL3)
2701b:3	Analyze the concepts of HRM in Recruitment, Selection and Training & Development. (BTL4)
2701b:4	Evaluate PERT/CPM Techniques in project management& and Basic knowledge about Strategy formulation and implementation in enterprises. (BTL5)
2701b:5	Understand the modern concepts in management like SCM, BPO, Six Sigma and TQM. (BTL2)

COURSE NAME: METROLOGY & MEASUREMENTS LABORATORY

COURSE CODE: 19A03702P

CO No.	COURSE OUTCOME
3702P:1	Study of sensors, Hydraulic and Pneumatic actuators and experiment ion of its characterization for industrial applications. (BTL2)
3702P:2	Differentiate the accuracy of different instruments.. (BTL2)
3702P:3	Analyze the measurement data obtained from different measuring instruments for the same physical quantity.(BTL4)

CO No.	COURSE OUTCOME
3702P:4	Study of sensors, Hydraulic and Pneumatic actuators and experiment ion of its characterization for industrial applications. (BTL2)

COURSE NAME: INTRODUCTION TO CAD/CAM LAB

COURSE CODE: 19A03602P

CO No.	COURSE OUTCOME
3602P:1	Generate CAD models.
3602P:2	Write CNC programs for various machining operations.

COURSE NAME: INTERNET OF THINGS LABORATORY

COURSE CODE: 19A05406P

CO No.	COURSE OUTCOME
5406P:1	Choose the sensors and actuators for an IoT application (L1)
5406P:2	Select protocols for a specific IoT application (L2)
5406P:3	Utilize the cloud platform and APIs for IoT application (L3)
5406P:4	Experiment with embedded boards for creating IoT prototypes (L3
5406P:5	Design a solution for a given IoT application (L6)

IV BTECH. IIND SEM

COURSE NAME: ROBOTICS AND APPLICATIONS IN MANUFACTURING

COURSE CODE: 19A03801b

CO No.	COURSE OUTCOME

3801b:1	Illustrate the industrial applications of robot vision system.(L3) ● ●●
3801b:3	Understand the basic concepts of robot controlling systems.(L2)
3801b:3	Evaluate D-H notations for simple robot manipulator.(L4)
3801b:4	Define a robot and homogeneous transformations.(L1)

COURSE NAME: NON-DESTRUCTIVE TESTING

COURSE CODE: 19A03802b

CO No.	COURSE OUTCOME
3802b:1	Explain various methods of non-destructive testing. (l3)
3802b:2	Apply relevant non-destructive testing method different applications. (l3)
3802b:3	Explain the applications of railways, nuclear and chemical industries. (l2)
3802b:4	Outline the limitations and disadvantages of nde. (l2)
3802b:5	Explain the applications of nda of pressure vessels, casting and welding constructions (l2)