- **Department Name :-Sciences and Humanities**
- **UG Program Name :-NA**
- **Vision and Mission :- NA**

Sr. No.	Program Outcomes
1.	NA

Sr. No.	Program Specific Outcomes
1.	NA

Sr. No.	Sem	Course Code	Course Name	Course Outcome
1.	I	SH1313	General Physics and Optics	CO1: Compare the behavior of mechanical system under the influence of damping, and external periodic force
				CO2: Use the principles of architectural acoustics to assess the acoustical characteristics of a hall
				CO3: Analyze the interference in thin films, wedge shaped film and Newton's rings to calculate conditions in constructive and destructive interference
				CO4: Examine the behavior of microscopic particles using the theories in quantum mechanics such as wave particle duality, uncertainty principle, and particle in 1D infinite potential box problem
				CO5: Compare the semiconductors based on type of charge carrier, band energy diagram, location of Fermi energy, and Hall effect
				CO6: Classify the different types of laser based on fundamentals of operation including solid state, and gas laser
2.	II	SH1241	Quantum Physics and Materials	CO1: Examine the behavior of microscopic particles using the principles of quantum mechanics such as wave particle duality and uncertainty principle
				CO2: Solve Schrodinger wave equation for simple 1D problems like particle in 1D infinite potential box, particle crossing infinite potential barrier, and simple harmonic oscillator using principles of Quantum mechanics
				CO3: Compare the semiconductors based on type of charge carrier, band energy diagram, location of Fermi energy, and Hall effect
				CO4: Classify the laser and optical fibers based on fundamentals of operation, types, characteristics, and applications
				CO5: Analyze magnetic materials and superconductors based on properties, types, and applications

3.	I	SH1056	Matrices and Differential Equations	CO1: Use the concepts of matrices that serve as an essential basis for several computational techniques
				CO2: Solve the problems on ordinary differential equations analytically and numerically.
				CO3: Make use of different methods to solve simultaneous algebraic linear equations
				CO4: Apply the relevant numerical method for interpolating the polynomial
4.	I	SH1201	Linear Algebra and Ordinary Differential Equations	CO1: Use the concepts of matrices and vector spaces that serve as an essential basis for several computational techniques.
				CO2: Solve the different problems on vector spaces
				CO3: Apply the different methods to solve simultaneous algebraic linear equations
				CO4: Solve the problems on ordinary differential equations analytically and numerically
5.	I/II	SH1135	Engineering Graphics	CO1: Draw the projections of line, plane and regular solids with respect to reference planes as per given conditions using AUTOCAD.
				CO2: Generate the sectional view, true shape of the section and development of the solid with the help of AUTOCAD software
				CO3: Prepare orthographic views of engineering components with AUTOCAD software
6.	I	SH1515	General Physics and Optics Lab	CO1: Develop the skills of performing the experiments relevant to theories in optics, oscillations, semiconductors, ultrasound, and quantum mechanics
				CO2: Use required measuring tools and techniques to conduct experiment in theories related to optics, oscillations, semiconductors, ultrasound, and quantum mechanics
				CO3: Interpret the collected data from experiment to determine the relevant physical quantity
				CO4: Write a lab report, which communicates the observed findings in clear manner
7.	II	SH1281	Quantum Physics and Materials Lab	CO1: Develop the skills of performing the experiments relevant to theories in optics, semiconductors, hysteresis, and quantum mechanics.
				CO2: Use required measuring tools and techniques to conduct the experiment in optics, oscillations, semiconductors, ultrasound, and quantum mechanics
				CO3: Interpret the collected data from experiment to determine the relevant physical quantity
				CO4: Write a lab report, which communicates the observed findings in clear manner
8.	I	SH1101	Matrices and Differenti	CO1: Use MATLAB for interactive computations.
				CO2: Familiar with memory and file management in MATLAB

			al Equations Lab	CO3: Generate plots and export this for use in reports and presentations
				CO4: Familiar with strings, matrices, and their use
9.	I	SH1221	Linear Algebra and Ordinary Differential Equations Lab	CO1: Use MATLAB for interactive computations.
				CO2: Familiar with memory and file management in MATLAB
				CO3: Generate plots and export this for use in reports and presentations
				CO4: Familiar with strings, matrices, and their use
10.	I	SH1834	English Proficiency Lab-I	CO1: Analyze aspects of nature and process of communication in professional contexts.
				CO2: Demonstrate active receptive skills of English language
				CO3: Apply speaking skills in various situations
				CO4: Make use of English language with grammatical accuracy
11.	I	SH1585	Japanese Language Lab Level-I	CO1: Acquire basic Japanese language skills (listening, speaking, writing, and reading).
				CO2: Enable students demonstrate an awareness of the relevance of Japanese language to professions and careers
				CO3: Make students understand the cultures and civilizations of the country of Japan
				CO4: Enable the students to function in an environment where Japanese is used exclusively
12.	I	SH1604	German Language Lab Level-I	CO1: Make use of familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type
				CO2: Express him /herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has.
				CO3: Interact in a simple way provided the other person talks slowly and clearly and is prepared to help
				CO4: Make use of the basic grammar concepts correctly
				CO5: Demonstrate reading and writing skills
13.	I	SH1853	Engineering Practice Lab-I	CO1: Acquire skills in basic engineering practice.
				CO2: Use hand tools and power tools
				CO3: Develop sheet metal model for specific application
				CO4: Illustrate the various operations performed in machine shop
				CO5: Perform different joining operations
				CO6: Perform pipefittings operations

14.	I/II	SH1893	Engineering Exploration and Design Project	CO1: Explain the role of an Engineer as a problem solver.
				CO2: Design engineering solutions to complex problems utilizing multi-disciplinary systems approach
				CO3: Examine a given problem using process of engineering problem analysis
				CO4: Build simple systems/prototypes using engineering design and development process
				CO5: Analyze engineering solutions from ethical and sustainability perspectives
				CO6: Apply basics of engineering project management skills in project development
15.	I	**SH1181**	**Advanced Engineering Chemistry**	CO1: Examine water quality for industrial and domestic sector and suggest remedial measures.
				CO2: Distinguish the basic concepts of spectroscopic methods for characterization of advanced materials
				CO3: Illustrate fundamentals of various polymers and distinguish their applications in engineering field
				CO4: Explain the synthesis and applications of nanomaterials in engineering sector
				CO5: Identify causes of corrosion and its remedial measures
				CO6: Demonstrate the fundamentals of electroplating with its applications
16.	II	SH1036	Modern Engineering Chemistry	CO1: Examine water quality for industrial and domestic sector and suggest remedial measures
				CO2: Distinguish the basic concepts of spectroscopic methods for characterization of advanced materials
				CO3: Interpret components of the various systems using Phase rule concept and outline the various applications of alloys
				CO4: Explain the synthesis and applications of nanomaterials in engineering sector
				CO5: Identify causes of corrosion and its remedial measures
				CO6: Compare types and quality of fuels, lubricants and illustrate the applications of batteries
17.	II	SH1026	Calculus	CO1: Solve problems on improper and multiple integrals
				CO2: Sketch the curve and use it to solve the problems on multiple integral
				CO3: Prove the results of partial differentiation
				CO4: Apply partial differentiation for problems on jacobian, errors and approximations, maxima and minima

18.	II	SH1261	Calculus and Complex variables	CO1: Solve problems on improper and multiple integrals
				CO2: Sketch the curve and use it to solve the problems on multiple integral
				CO3: Prove the results of partial differentiation and apply partial differentiation for problems on Jacobian, maxima and minima
				CO4: Solve various problems of complex variable
19.	I/II	SH1294	Basic Electrical Engineering	CO1: Solve D.C. and A.C. electric circuits.
				CO2: Illustrate the notions of magnetic circuits
				CO3: Explore switchgear for electrical installations and illumination
				CO4: Elaborate transformer and rotating electrical machines
20.	I/II	SH136	Biology for Engineers	CO1: Apply biological engineering principles, procedures needed to solve real-world problems.
				CO2: Describe the functions of biological systems
				CO3: Analyze biological phenomena and compute work done at microscale
				CO4: Explain working of different biomedical instruments
				CO5: Select the sensors for given biological applications
				CO6: Explain relevant aspect of movement control process
21.	I/II	SH1333	Programming for Problem Solving	CO1: Explain the basic terminologies and concepts of C programming language.
				CO2: Construct the algorithm and flow chart to solve the given problem
				CO3: Write a C program for given problem statement
				CO4: Examine the given C program to remove the logical & syntax errors and predict the correct output
22.	I/II	SH138	Indian Politics and Economics	CO1: Explain process and philosophy behind formation of Indian Constitution.
				CO2: Differentiate between different political thoughts in India
				CO3: Compare different policy regimes in view of economic growth of India
				CO4: Analyze Policies and Performance in agriculture and industry
23.	I/II	SH1535	Engineering Chemistry Lab	CO1: Examine the materials by using analytical instruments
				CO2: Identify the quality of water for industrial and domestic purposes
				CO3: Apply the knowledge of corrosion science for measurement of rate of corrosion

				CO4: Apply science of polymers and nanomaterials in the synthesis of materials
				CO5: Inspect the quality of fuel
24.	II	SH1161	Calculus Lab	CO1: Develop codes for different types integrals.
				CO2: Sketch the curves
				CO3: Solve various problems on partial differentiation by MATLAB
25.	II	SH1301	Calculus and complex variables Lab	CO1: Develop codes for different types integrals.
				CO2: Sketch the curves
				CO3: Solve various problems on partial differentiation by MATLAB
26.	I/II	SH1794	Basic Electrical Engineering Lab	CO1: Explain the concept of circuit laws and network theorems and apply them to specific network.
				CO2: To demonstrate balanced and unbalanced star and delta connected supply and measure power in three phase circuits
				CO3: To demonstrate characteristics equations for DC machines and single phase transformer
				CO4: Explain operation, features of electric machines and their applications
				CO5: Apply the skills using electrical measuring devices
27.	I/II	SH1913	Programming for Problem Solving Lab	CO1: Describe various terminologies and concepts of C programming language
				CO2: Construct the algorithm and flow chart to solve the given problem
				CO3: Implement a 'C' program for given problem statement
				CO4: Test the implemented 'C' programs by removing syntax & logical errors for getting expected output on various input
28.	II	SH1623	English Proficiency Lab - II	CO1: Identify the need of personal appearance and grooming for professionals.
				CO2: Demonstrate conversational and comprehension skills of English language
				CO3: Demonstrate writing skills through reports, letters, emails, and notices
				CO4: Organize content of technical documents in specific forms
29.	II	SH1664	Japanese Language Lab Level - II	CO1: Acquire basic Japanese language skills (listening, speaking, writing, and reading).
				CO2: Enable students demonstrate an awareness of the relevance of Japanese language to professions and careers
				CO3: Make students understand the cultures and civilizations of the country of Japan
				CO4: Enable the students to function in an environment where Japanese is used exclusively

30.	II	SH1683	German Language Lab Level - II	CO1: Make use of familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type
				CO2: Express him /herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has
				CO3: Interact in a simple way provided the other person talks slowly and clearly and is prepared to help
				CO4: Make use of the basic grammar concepts correctly
				CO5: Demonstrate reading and writing skills
31.	II	SH1643	Engineering Practice Lab - II	CO1: Make wooden job.
				CO2: Make Sheet metal job
				CO3: Make job by various machining processes
				CO4: Make job by joining processes
32.	I/II	SH1321	Universal Human Values and Professional Ethics	CO1: Explain the significance of value inputs in education, social, and professional life.
				CO2: Apply the value of harmonious relationship based on trust and respect in their life and profession
				CO3: Define the role of a human being in ensuring harmony in society and nature
				CO4: Make use of ethical conduct in formulation of the strategy for ethical life and profession
33.	I/II	SH1341	Sports and Yoga	CO1: Illustrate the importance of practicing sports & Physical activities.
				CO2: Perform breathing exercises and healthy fitness activities
				CO3: Demonstrate basic techniques associated with yoga and meditation
				CO4: Improve personal health through sports, aerobics and yoga
34.	I/II	SH140	Classical Music	CO1: Illustrate basic knowledge of Indian classical music.
				CO2: Demonstrate the rhythm system applied in classical music
				CO3: Apply different types of Taal, Matra Kandh, Saam, Khali, Thhali & Aavatanan
				CO4: Apply basic outline through various prescribed ragas practically
35.	I/II	SH142	Tabla	CO1: Illustrate the fundamental aspects of Tabla musical instrument.
				CO2: Demonstrate the performance of Tabla musical instrument
				CO3: Apply different types of Taal, Matra Kandh, Saam, Khali, Thhali & Aavatanan.
				CO4: Apply basic outline through various prescribed ragas practically

36.	I/II	SH144	Drama	CO1: Illustrate the fundamental aspects of drama performance.
				CO2: Develop the ability to perform drama in scientific way
				CO3: Apply basic techniques of scene designing, properties & stage lighting
37.	I/II	SE1054	Basics of Civil Engineering	CO1: Identify the components of a given type of building structure and recommend their suitability under specified soil and loading conditions.
				CO2: Prepare plan of a single storey residential building for the given requirements using building planning principles, byelaws and property document information
				CO3: Assess the quality of different construction materials based on their engineering properties and explain the standard procedures followed for using them in the construction of building components
				CO4: Determine included angles, areas, reduced levels and contours for the specified ground points or surfaces using the methods of horizontal and vertical measurements
				CO5: Describe the components of a specified infrastructure system and the functions served by them
38.	I/II	SE1134	Green Technology	CO1: Explain the basic principles of green chemistry and ecology.
				CO2: Discuss concept of green buildings and green management
				CO3: Compare conventional and non-conventional energy sources
				CO4: Discuss solid waste processing techniques
				CO5: Describe various Green innovations for sustainability
39.	I/II	SE1094	Engineering Materials	CO1: Classify materials on the basis of various properties.
				CO2: Estimate different mechanical properties using destructive testing methods
				CO3: Select suitable non-destructive testing method for flaw detection in component
				CO4: Explain composites, non ferrous materials and alloys with their applications
				CO5: Identify the recycling issues associated with various engineering materials
40.	I/II	SE1453	Creativity, Design Thinking and Entrepren	CO1: Learn structured approach to creativity, problem identification and problem solving in a new venture context
				CO2: Apply design thinking approach to identify innovation opportunities and develop solutions

			eurial Mindset	CO3: Identify, validate and define specific innovation opportunities through Jobs-to-be-Done methodology
				CO4: Develop mindset of a successful entrepreneur
				CO5:
41.	I/II	SE1433	Basics of Mechanical Engineering	CO1: Explain different power generation systems.
				CO2: Select appropriate energy conversion device for the given application
				CO3: Classify vehicles on the basis of different parameters
				CO4: Compare two stroke and four stroke 1C engines.
				CO5: Describe different transmission devices in a given system
				CO6: Choose suitable materials and manufacturing processes for a given application
42.	I/II	SE1472	Introduction to Artificial Intelligence	CO1: Explain the different terminologies used in Artificial Intelligence.
				CO2: Identify engineering and societal problems that can be efficiently solved by artificial intelligence techniques
				CO3: Demonstrate the search algorithms to solve problems
				CO4: Apply Python Programming in AI based applications
				CO5: Illustrate the concepts of machine learning
				CO6: Describe the robot tasks, architecture and usage in real world
43.	I/II	SE1751	Basics of Sensor Technology	CO1: Recognize basic analog and digital devices used for different electronic applications
				CO2: Explain the working principles of various sensors
				CO3: Identify suitable sensors and transducers for real time applications
				CO4: Analyze the different sensor based electronic circuits
44.	I/II	SE1811	Introduction to Electric Vehicles	CO1: Justify the need for EVs and HEVs from environment and policy perspectives.
				CO2: Demonstrate the knowledge of electric vehicle technology
				CO3: Elaborate the hybrid electric vehicle technology
45.	I/II	SE185	Basics of Robotics and Automation	CO1: Explain Principles and laws of Robotics.
				CO2: Select Robot for system automation
				CO3: Justify requirement of automation
				CO4: Illustrate microprocessors and microcontrollers for system automation

46.	I/II	SE187	Fundamentals of Mechatronics	CO1: Identify various elements of mechatronics systems and signal conditioning.
				CO2: Demonstration of sensor/Actuator/controller/control algorithm for different applications
				CO3: Differentiate between PLC/Microprocessor/Microcontroller