1.1.1 Curriculum Design

The curriculum development process at NPR College, introduced in 2023, follows Outcome-Based Education (OBE) and the Choice-Based Credit System (CBCS) to equip graduates with the competencies needed for global success. Key features include:

1. **Curriculum Philosophy**: Designed to blend disciplinary knowledge and core skills, the curriculum aligns Program Educational Objectives (PEOs) and Program Specific Outcomes (PSOs) with local and global needs, fostering employability, higher studies, and entrepreneurship.
2. **Balanced Structure**: Combines theory, labs, projects, seminars, and internships to ensure comprehensive learning and industry readiness.
3. **Stakeholder Involvement**: Feedback from alumni, employers, faculty, and students ensures relevance, adaptability, and alignment with professional and academic needs.
4. **Standards Alignment**: Complies with UGC, AICTE, Anna University, and global benchmarks to maintain quality and competitiveness.

The multi-step process includes formulating objectives, regulatory compliance, curriculum design, stakeholder feedback, approvals from the Board of Studies (BOS) and Academic Council, and final publication. Each course is mapped to defined outcomes, ensuring alignment with program goals. This dynamic, industry-relevant approach prepares students for evolving global challenges while meeting national and international standards.

NPR COLLEGE OF ENGG & TECHNOLOGY NATHAM

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Natham, Dindigul(Dt)-624 401

NPR
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai | Accredited by NAAC with 'A' GRADE
Recognized by UGC under 2 (f) | ISO 9001:2015 Certified | Web: www.nprcolleges.org | E-Mail: nprcetprincipal@nprcolleges.org
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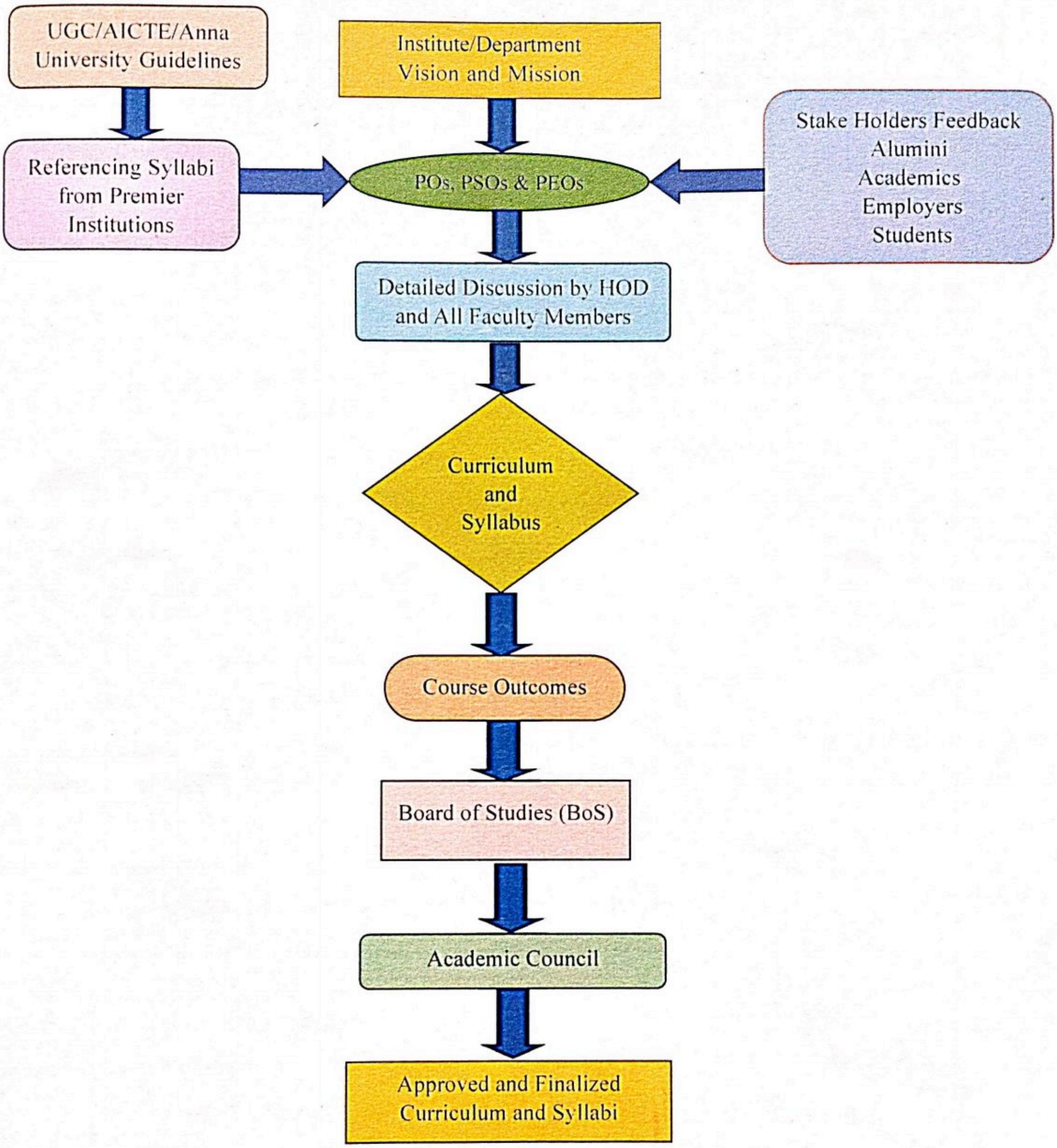
CURRICULUM AND SYLLABI DEVELOPMENT FLOWCHART



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The curriculum offers a well-rounded education, combining academic and practical learning to support students' knowledge and skill development. It includes:

Subject Categories:

- Humanities and Social Sciences Courses (HSC)
- Basic Sciences Courses (BSC)
- Engineering Sciences Courses (ESC)
- Professional Core Courses (PCC)
- Professional Electives Courses (PEC)
- Open Electives Courses (OEC)
- Employability Enhancement Courses (EEC)
- Mandatory Non-credit Courses

Experiential Learning:

- Industrial Visits
- Eminent Speaker Lectures
- Workshops and Conferences
- Summer Training Programs
- Project Work

Additional Learning Pathways:

- Add-On Courses
- Online Course Credit Transfer (NPTEL, SWAYAM)
- Internship Opportunities

This curriculum balances foundational theory, practical skills, and industry exposure to prepare students for academic and professional success.

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1.1.1 DEPARTMENT OF CIVIL ENGINEERING

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English-I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To make the students understand the concepts of vector calculus and applications. To acquaint the student with mathematical tools needed in evaluating ordinary differential equations and their applications.	CO1 Use the matrix algebra methods for solving practical problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application problems. CO4 Understand the concepts of Gradient, divergence and curl of a vector point function and related applications. CO5 Apply various techniques in solving ordinary differential equations.	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12

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3	23PH101 BSC	Engineering Physics	Global	To instill the essentials of properties of matter. To gain knowledge of electromagnetic waves and its applications. To amplify the information on optical fiber for communication purposes. To describe the principles of quantum mechanics and their various applications. To provide the fundamental understanding of crystals and their numerous crystal formations.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications. CO2 Express their knowledge in electromagnetic waves. CO3 Infer the characteristics of laser for various Engineering applications and expand the understanding of optical fibers use in communications. CO4 Apply quantum theory's sophisticated physics notions to the matter's characterization. CO5 Know the fundamentals of crystal formations and growth methods.	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12
4	23CY101 BSC	Engineering Chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterial. To introduce the basic concepts and applications of polymers and composites. To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.	CO1 Summarize the water related problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis. CO3 Discuss The types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels. CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	PO-1 PO-2 PO-3 PO-7 PO-12
5	23GE102 ESC	Problem Solving and Python Programming	Global	To understand the basics of algorithmic problem solving. To learn to solve problems using Python conditionals and loops. To define Python functions and use function calls to solve problems.	CO1 Understand the concepts of computational thinking and algorithmic problem-solving techniques. CO2 Develop simple python programs for applying the concepts of datatypes, expressions, and python statements.	PO-1 PO-2 PO-3 PO-4 PO--5 PO-10 PO-11 PO-12

COLLEGE OF ENGG. & TECHNOLOGY NATHAM NPR

				To use Python data structures - lists, tuples, dictionaries to represent complex data. To do input/output with files in Python.	CO3 Develop Python programs for solving real-time computational problems by using conditionals, looping, functions, and strings. CO4 Understand the concepts of compound data using Python lists, tuples, and dictionaries. CO5 Develop python programs for solving computational problems by using modules, files, and python packages.	
6	23GE103 HSMC	தமிழர்மரபு /Heritage of Tamils	National			
7	23GE111 ESC	Problem Solving and Python Programming Laboratory	Global	To understand the problem-solving approaches To learn the basic programming constructs in Python. To practice various computing strategies for Python-based solutions to real worldproblems To use Python data structures - lists, tuples, dictionaries To do input/output with files in Python.	CO1 Develop simple python programs for applying the concepts of datatypes, expressions, and python statements. CO2 Develop Python programs using conditionals, looping, functions, and strings for solving real-time computational problems. CO3 Understand the concepts of compound data using Python lists, tuples, and dictionaries. CO4 Develop python programs for solving problems by using modules, files, and python packages. CO5 Utilize Python packages for developing real-world software applications.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9 PO-10 PO-11 PO-12
8	23BS111 BSC	Physics and Chemistry Laboratory	Global	Chemistry Laboratory To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper. To induce the students to familiarize with electroanalytical techniques such as, pH metry and potentiometry	Physics Laboratory CO1 Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves. CO2 Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids. CO3 Measure the elastic moduli and moment of inertia of	PO-1 PO-2 PO-8 PO-9 PO10

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				To make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions. To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	given materials with the help of suggested procedures. CO4 Experiment the relationship between the light and matter & properties of liquids. CO5 Estimate the thermal properties and thermal behavior of the material. Chemistry Laboratry CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO. CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles CO5 Quantitatively analyse the impurities in solution by electroanalytical methods.	
9	23GE112 EEC	English Laboratory - I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing their opinions via various media.	CO1 To listen to and comprehend general as well as complex academic information. CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	PO-9 PO-10 PO-12
10	23HS201 HSMC	Professional English-II	Global	To engage learners in meaningful language activities to improve their reading and writing skills.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes	PO-9 PO-10 PO-12

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				To learn various reading strategies and apply in comprehending documents in professional context. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	through technical texts and draft a report with suggestions. CO3 To analyze problems in order to arrive at feasible solutions and communicate them in thewritten format. CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	
11	23MA201 BSC	Statistics and Numerical Methods	Global	This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology. To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems. To introduce the basic concepts of solving algebraic and transcendental equations. To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines. To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.	CO1 Apply the concept of testing of hypothesis for small and large samples in real life problems. CO2 Apply the basic concepts of classifications of design of experiments in the field of agriculture. CO3 Apply the basic concepts and Techniques of solving algebraic and transcendental equations. CO4 Understand the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. CO5 Solve the ordinary differential equations with initial conditions by using certain techniques with engineering applications.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-11 PO-12 PO-9
12	23PH201 BSC	Physics for Civil Engineering	Global	To provide an introduction to the fundamentals of heat transmission through various materials, building thermal performance, and diverse thermal applications.	CO1 To learn about thermal performance of buildings, insulation, and heat transfer through various materials..	PO-1 PO-2 PO-3 PO-4 PO-5 PO-7

				To dissemination of information on building ventilation and air conditioning. To introduce the ideas of soundproofing and lighting layouts.. To describe the properties and uses of dielectric, and superconducting materials. To create knowledge of safety precautions and natural disasters	CO2 To know about building air conditioning and ventilation systems.. CO3 To comprehend the ideas behind lighting schemes, noise insulation, and sound absorption.. CO4 To appreciate how composites, metallic glasses, shape memory alloys, and ceramics are processed and used. CO5 To Explore about safety precautions and natural disasters including earthquakes, cyclones, and fires.	PO-12
13	23BE202 ESC	Basic Electrical, Electronics and Instrumentation Engineering	Global	To introduce the basics of electric circuits analysis and various electrical equipment installations To introduce working, operating principle of various electrical machines, analog devices and their characteristics and the function of various sensors	CO1 Compute the electric circuit parameters for simple problems CO2 Acquire the knowledge of different types of electrical installation CO3 Explain the working principle and applications of electrical machines CO4 Illustrates the characteristics of analog electronic devices CO5 Explain the working principle and applications of electrical machines	PO-1 PO-2 PO-3 PO-7 PO-11 PO-12
14	23ME201 ESC	Engineering Mechanics	Global	To expose various laws of forces for the equilibrium of rigid bodies. To introduce the concept of properties of surfaces and solids. To impart knowledge on the fundamental of dynamics of particles and rigid bodies.	CO1 Identify various force system in a plane. CO2 Solve equilibrium of rigid bodies in two dimensions. CO3 Calculate the centroid, areas and mass moment of inertia for surface and solids. CO4 Apply the concept of dynamics for particle motions. CO5 Determine the friction of elements and dynamics of rigid bodies.	PO-1 PO-2 PO-3 PO-4 PO-12
15	23GE202 ESC	Engineering Graphics	Global	Drawing engineering curves. Drawing freehand sketch of simple objects. Drawing orthographic projection of solids and section of solids. Drawing development of solids.	CO1 Construct the conic curves, involutes and cycloid. CO2 Solve practical problems involving projection of lines, points and plane surfaces CO3 Draw orthographic projection of solids and freehand sketch of simple objects.	PO1 PO2 PO3 PO11

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				Drawing isometric and perspective projections of simple solids.	CO4 Draw the sectioning and development of simple solids. CO5 Draw isometric and perspective projections of simple solids.	
16	23GE201 HSMC	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	National			
17	23GE211 ESC	Engineering Practices Laboratory	Global	Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work. Wiring various electrical joints in common household electrical wire work. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.	CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. CO2 Wire various electrical joints in common household electrical wire work. CO3 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipment's; Make a tray out of metal sheet using sheet metal work. CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	PO1 PO2 PO5 PO6 PO7 PO12
18	23BE211 ESC	Basic Electrical, Electronics and Instrumentation Engineering Laboratory	Global	To train the students in conducting load tests on electrical machines To gain practical experience in characterizing electronic devices To train the students to measure three phase power	To train the students in conducting load tests on electrical machines To gain practical experience in characterizing electronic devices To train the students to measure three phase power	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9
19	23GE212 EEC	English Laboratory - II	Global	To identify varied group discussion skills and apply them to take part in effective discussions in a professional context. To analyze concepts and problems and make effective	CO1 Speak effectively in group discussions held in a formal/semi formal contexts. CO2 Discuss, analyze and present concepts and problems from various	PO-9 PO-10 PO-12

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				presentations explaining them clearly and precisely. To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them attend interviews successfully. To make them Employable Graduates and use English language skills effectively in various situations.	perspectives to arrive atsuitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	

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1.1.1 B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English - I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs,definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To Make the students understand the concepts of vector calculus and applications.	CO1 Use the matrix algebra methods for solving practical Problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application Problems. CO4 Understand the concepts of	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12

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				To acquaint the student with mathematical tools needed in evaluating ordinary differential equations and their applications.	Gradient, divergence and curl of a vector point function and related applications. CO5 Apply various techniques in solving ordinary differential equations.	
3	23PH101 BSC	Engineering Physics	Global	To instill the essentials of properties of matter. To gain knowledge of electromagnetic waves and its applications. To amplify the information on optical fiber for communication purposes. To describe the principles of quantum mechanics and their various applications. To provide the fundamental understanding of crystals and their numerous crystal formations.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications. CO2 Express their knowledge in electromagnetic waves. CO3 Infer the characteristics of laser for various Engineering applications and expand the understanding of optical fibers use in communications. CO4 Apply Quantum theory's Ophisticated physics notions to the matter characterization. CO5 Know the fundamentals of crystal formations and growth methods.	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12
4	23CY101 BSC	Engineering Chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterials. To introduce the basic concepts and applications of polymers and composites. To facilitate the understanding of different types of fuels, their preparation, properties and	CO1 Summarize the water related Problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterial in medicine, agriculture, energy,	PO-1 PO-2 PO-3 PO-7 PO-12

				combustion characteristics. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.	electronics and catalysis. CO3 Discuss the types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels. CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	
5	23GE101 ESC	Problem Solving and C Programming	Global	To understand the fundamentals of Problem solving using Algorithm and Flowchart To teach the basic programming constructs for solving simple Problems To introduce the basic concepts of arrays and strings To acquaint the students about functions and pointers To develop applications in C using structures and union To impart knowledge on the concepts of file handling	CO1 Understand the basic concepts of Problem solving and C programming constructs CO2 Construct and implement C programs for solving computational Problems using arrays and strings CO3 Implement simple real-time applications in C using functions and pointers CO4 Implement the applications in C using structures CO5 Implement the applications using file handling.	PO- 5 PO- 1 PO- 2 PO- 3 PO- 11
6	23GE103 HMSC	தமிழர்மரபு /Heritage of Tamils	National			
7	23BS111 BSC	Physics And Chemistry Laboratory	Global	Physics Laboratory To learn the correct usage of several types of physics lab equipment. To learn, how to gather, present, and understand facts in a simple and succinct manner.	CO1 Apprehend the concepts of interference, diffraction of light and recognize the	PO-1 PO-2 PO-8 PO-9 PO-10

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				To learn Physics-related Problem-solving abilities and experimental data interpretation. To identify experimental measurement error and the methods used to reduce it To encourage active participation from the learner in all aspects of the lab exercises. Chemistry Laboratory To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper. To induce the students to familiarize with electro analytical techniques such as, pH metry and potentiometry To Make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions. To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	resonance concept of waves. CO2 Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids. CO3 Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures. CO4 Experiment the relationship between the light and matter & properties of liquids. CO5 Estimate the velocity of sound and compressibility of liquid. Chemistry Laboratory CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO. CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles CO5 Quantitative	

					ly analyse the impurities in solution by electro analytical methods.	
8	23GE112 EEC	English Laboratory -I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing their opinions via various media.	CO1 To listen to and comprehend general as well as complex academic information. CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	PO-9 PO-10 PO-12
9	23HS201 HSMC	Professional English - II	Global	To engage learners in meaningful language activities to improve their reading and writing skills. To learn various reading strategies and apply in comprehending documents in professionalcontext. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for Problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions. CO3 To analyze Problems in order to arrive at feasible solutions and communicate them in thewritten format.	PO-9 PO-10 PO-12

					CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	
10	23MA202 BSC	Transforms and Numerical Methods	Global	To understand the concept of Laplace transforms can be used for efficiently solving the problems that occur in various branches of engineering disciplines. To understand the concepts of Dirichlet's conditions and Fourier series. To Study the application of transform techniques using Fourier Transforms. To introduce the basic concepts of solving algebraic and transcendental equations. To understand various techniques and methods of solving ordinary differential equations.	CO1 To apply Laplacetransform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients. CO2 To understand general periodic functions and apply in problems of Fourier series, which are sums of sines and cosines. CO3 To use the Fourier transform as the tool to connect the time domain and frequency domain in signal processing. CO4 Understand the basic concepts and Techniques of solving algebraic and transcendental equations. CO5 Solve the ordinary differential equations with initial conditions by using certain techniques with engineering applications.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-9 PO-11 PO-12
11	23PH202 BSC	Physics For Electrical Engineering	Global	To understanding the fundamental physics of conducting materials and magnetic material characteristics.	CO1 To understand about the creation of energy band structures, free	PO-1 PO-2 PO-3

				To impart fundamental knowledge of semiconductor device and electron transport characteristics. To understand the applications of dielectric materials. To know how optical materials for optoelectronics work. To recognize the fundamentals of quantum structures, the characteristics of nanomaterials, and their uses.	electron theory, and quantum theory and gain knowledge about magnetic materials and its applications. CO2 To evaluate the functions of semiconductors and their uses. CO3 To apply the knowledge of dielectric materials, as well as the applications. CO4 To understand about the uses of superconducting and Optical properties of materials. CO5 To describe the basic principles behind the operation of nano electronic devices.	PO-4 PO-5 PO-6 PO-7 PO-12
12	23BE203 ESC	Basics Of Civil and Mechanical Engineering	Global	To provide the students an illustration of the significance of the Civil and Mechanical Engineering Profession in satisfying the societal needs. To help students acquire knowledge in the basics of surveying and the materials used for construction. To provide an insight to the essentials of components of a building and the infrastructure facilities. impart knowledge on the fundamental of dynamics of particles and rigid bodies. To explain the component of power plant units and detailed explanation to IC engines their working principles To explain the Refrigeration & Air-conditioning system.	CO1 Understanding profession of Civil and Mechanical engineering. CO2 Illustrate the Basics in surveying and material used in construction. CO3 Summaries the planning of building, infrastructure and Building components CO4 Illustrate working principles of IC Engine, different types of power plant and turbines. CO5 Elaborate the components and working principles of Refrigeration and Air conditioning system.	PO-1 PO-8 PO-12

13	23GE202 ESC	Engineering Graphics	Global	Drawing engineering curves. Drawing freehand sketch of simple objects. Drawing orthographic projection of solids and section of solids. Drawing development of solids. Drawing isometric and perspective projections of simple solids.	CO1 Construct the conic curves, involutes and cycloid. CO2 Solve practical problems involving projection of lines, points and plane surfaces CO3 Draw orthographic projection of solids and freehand sketch of simple objects. CO4 Draw the sectioning and development of simple solids. CO5 Draw isometric and perspective projections of simple solids.	PO-1 PO-2 PO-3 PO-10 PO-12
14	23EE201 PCC	Analysis Of Electric Circuits	Global	To introduce electric circuits and its analysis To provide key concepts to analyze and understand electrical circuits To impart knowledge on solving circuit equations using network theorems To educate on obtaining the transient response of circuits. To introduce the phenomenon of resonance in coupled circuits. To introduce Phasor diagrams and analysis of single &three phase circuits	CO1 Explain circuit's behavior using circuit laws. CO2 Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit. CO3 Compute the transient response of first order and second order systems to step and sinusoidal input. CO4 Compute power, line/ phase voltage and currents of the given three phase circuit. CO5 Comprehend the frequency response of series and parallel RLC circuits.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6 PO-7 PO-11 PO-12
15	23GE201 HSMC	தமிழர்மரபு /Heritage of Tamils	National			

16	23GE211 ESC	Engineering Practices Laboratory	Global	Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work. Wiring various electrical joints in common household electrical wire work. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.	CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; Make joints in wood materials used in common household wood work. CO2 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. CO3 Wire various electrical joints in common household electrical wire work. CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	PO-1 PO-2 PO-5 PO-6 PO-7 PO-12
17	23EE211 PCC	Electric Circuits Laboratory	Global	To simulate various electric circuits using Pspice/ MATLAB/e-Sim/Scilab To gain practical experience on electric circuits and verification of theorems	CO1 Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit (Ex 1) CO2 Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin, Norton and maximum power transfer) for the given DC/AC circuit (Ex 2-5) CO3 Analyze transient behavior of the given	PO- 1 PO- 2 PO- 3 PO- 4 PO- 5 PO- 7 PO- 8 PO- 9 PO- 12

					RL/RC/RLC circuit using simulation and experimental methods (Ex 6) CO4 Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods (Ex 7-8) CO5 Analyze the performance of the given three-phase circuit using simulation and experimental methods (Ex 9)	
18	23GE212 EEC	English Laboratory -II	Global	To identify varied group discussion skills and apply them to table part in effective discussions in a professional context. To analyze concepts and Problems and Make effective presentations explaining them clearly and precisely. To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them to attend interviews successfully. To Make them Employable Graduates and use English language skills effectively in various situations.	CO1 Speak effectively in group discussions held in a formal/semi-formal contexts. CO2 Discuss, analyze and present concepts and Problems from various perspectives to arrive atsuitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	PO-9 PO-10 PO-12

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1.1.1 COMPUTER SCIENCE AND ENGINEERING

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English - I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs,definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To Make the students understand the concepts of vector calculus and applications. To acquaint the student with mathematical tools needed in evaluating ordinary differential	CO1 Use the matrix algebra methods for solving practical Problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application Problems. CO4 Understand the concepts of Gradient, divergence	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12

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				equations and their applications.	and curl of a vector point function and related applications. CO5 Apply various techniques in solving ordinary differential equations.	
3	23PH101 BSC	Engineering Physics	Global	To instill the essentials of properties of matter. To gain knowledge of electromagnetic waves and its applications. To amplify the information on optical fiber for communication purposes. To describe the principles of quantum mechanics and their various applications. To provide the fundamental understanding of crystals and their numerous crystal formations.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications. CO2 Express their knowledge in electromagnetic waves. CO3 Infer the characteristics of laser for various Engineering applications and expand the understanding of optical fibers use in communications CO4 Apply quantum theory's sophisticated physics notions to the matter characterization. CO5 Know the fundamentals of crystal formations and growth methods.	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12
4	23CY101 BSC	Engineering Chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterials. To introduce the basic concepts and applications of polymers and composites.	CO1 Summarize the water related Problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterial in medicine, agriculture, energy, electronics and catalysis.	PO-1 PO-2 PO-3 PO-7 PO-12

				To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.	CO3 Discuss the types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels. CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	
5	23GE101 ESC	Problem Solving and C Programming	Global	To understand the fundamentals of Problem solving using Algorithm and Flowchart To teach the basic programming constructs for solving simple Problems To introduce the basic concepts of arrays and strings To acquaint the students about functions and pointers To develop applications in C using structures and union To impart knowledge on the concepts of file handling	CO1 Understand the basic concepts of Problem solving and C programming constructs CO2 Construct and implement C programs for solving computational Problems using arrays and strings CO3 Implement simple real-time applications in C using functions and pointers CO4 Implement the applications in C using structures CO5 Implement the applications using file handling.	PO- 5 PO- 1 PO- 2 PO- 3 PO- 11
6	23GE103 HSMC	தமிழர் மரபு /Heritage Of Tamils	National			
7	23BS111 BSC	Physics and Chemistry Laboratory	Global	Physics Laboratory To learn the correct usage of several types of physics lab equipment. To learn, how to gather, present, and understand facts in a simple and succinct manner.	CO1 Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves.	PO-1 PO-2 PO-8 PO-9 PO-10

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				To Make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions. To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	and compressibility of liquid. Chemistry Laboratory CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO. CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles CO5 Quantitatively analyse the impurities in solution by electro analytical methods.	
8	23GE112 EEC	English Laboratory -I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing	CO1 To listen to and comprehend general as well as complex academic information. CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses	**PO-9 PO-10 PO-12**

				their opinions via various media.	and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	
9	23HS201 HSMC	Professional English - II	Global	To engage learners in meaningful language activities to improve their reading and writing skills. To learn various reading strategies and apply in comprehending documents in professionalcontext. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for Problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions. CO3 To analyze Problems in order to arrive at feasible solutions and communicate them in thewritten format. CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	PO-9 PO-10 PO-12
10	23MA901	Probability And Statistics	Global	To provide necessary basic concepts in probability. To understand the basic concepts of one - dimensional random variable and to introduce some standard distributions applicable to engineering	CO1 To Understand the fundamental concepts of probability. CO2 By applying the knowledge of one-dimensional	PO-1 PO-2 PO-3 PO-4 PO-5 PO-9 PO-11

				which can describe real life phenomenon. To understand the basic concepts of two - dimensional random variables. To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life Problems. Apply the basic concepts of classifications of design of experiments in the field of agriculture.	random variables to standard distributions which can describe real life phenomenon. CO3 Understand the basic concepts of two-dimensional random variables and apply in engineering applications. CO4 Apply the concept of testing of hypothesis for small and large samples in real life Problems. CO5 Apply the basic concepts of classifications of design of experiments in the field of agriculture.	PO-12
11	23PH203 BSC	Physics For Information Science	Global	To understanding the fundamental physics of conducting materials, superconductors, and material characteristics. To impart fundamental knowledge of semiconductor device and electron transport characteristics. To get expertise in magnetic materials. To know how superconducting materials with null resistance and optical materials for optoelectronics work. To learn how nano electronic devices operate on a fundamental level.	CO1 To recognize the fundamental ideas behind different free-electron theories and establish the solids' electrical characteristics. CO2 To evaluate the functions of semiconductors and their uses. CO3 To employing quantum principles to examine the mechanisms at work in magnetic materials. CO4 To understand about the uses of superconducting and Optical	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6 PO-7 PO-12

					properties of materials. CO5 To show the fundamentals of how micro- and nano-electronic equipment functions.	
12	23BE201 ESC	Basic Electrical and Electronics Engineering	Global	To introduce the basics of electric circuits and analysis To import knowledge in the basics of working principles and application of electrical Machines To introduce analog devices and their characteristics To educate on the fundamental concepts of digital electronics To introduce the functional elements and working of measuring instruments	CO1 Compute the electric circuit parameters for simple Problems CO2 Examine the working principle and applications of electrical machines CO3 Illustrate the characteristics of analog electronic devices CO4 Examine the basic concepts of digital electronics CO5 Apply the concepts of principles of measuring instruments for real time applications	PO-1 PO-2 PO-3 PO-7 PO-11 PO-12
13	23GE901 BSC	Environmental Sciences and Sustainability	Global	To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on t biodiversity of India and its conservation. To impart knowledge on the causes, effects and control or prevention measures of environmental pollution. To study the dynamic processes and understand the features of the earth's interior and surface. To facilitate the understanding of global and Indian scenario of renewable and nonrenewable	CO1 To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. CO2 To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. CO3 To identify the causes, effects of natural	PO-6 PO-7 PO-9 PO-1 PO-2 PO-3 PO-4 PO-12

				resources, causes of their degradation and measures to preserve them. To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization.	disasters and contribute to the preventive measures in the society. CO4 To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. CO5 To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	
14	23CS201 PCC	Python Programming	Global	To guide students in problem-solving using Python conditionals and loops effectively. To guide students in problem-solving using Python conditionals and loops effectively. To enable students to utilize Python data structures such as lists, tuples, and dictionaries for representing complex data. To assist students in performing input/output operations with files in Python. To support students in using Python exceptions and libraries proficiently.	CO1 Understand the concepts of python data types, expressions and statements CO2 Implement Python programs for solving real-time computational Problems by using conditionals, looping, functions and strings CO3 Understand the concepts of compound data using Python lists, tuples and dictionaries CO4 Implement the python programs for	PO- 1 PO- 2 PO- 3 PO- 4 PO- 5 PO- 11 PO- 12

					solving computational Problems by using modules, files and python packages CO5 Implement the python programs for solving computational Problems by using Exceptions and Libraries	
15	23GE201 HSMC	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	National			
16	23GE211 ESC	Engineering Practices Laboratory	Global	Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work. Wiring various electrical joints in common household electrical wire work. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.	CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; Make joints in wood materials used in common household wood work. CO2 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. CO3 Wire various electrical joints in common household	PO-1 PO-2 PO-5 PO-6 PO-7 PO-12

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					electrical wire work. CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	
17	23CS211 PCC	Python Programming Laboratory	Global	To ensure students acquire proficiency in basic programming constructs in Python. To provide opportunities for students to apply various computational strategies to develop Python-based solutions for real-world problems. To enable students to effectively utilize Python data structures such as lists, tuples, and dictionaries. To guide students in performing input/output operations with files in Python. To support students in utilizing Python exceptions and libraries appropriately.	CO1 Understand the concepts of data types, expressions and statements of python CO2 Implement the Python programs using conditionals, looping, functions and strings for solving real-time computational Problems. CO3 Implement the Python programs using lists, tuples and dictionaries CO4 Implement the python programs for solving Problems by using modules, files and python packages CO5 Utilize the Python packages for developing real-world software applications	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9 PO-10 PO-11 PO-12
18	23GE212 EEC	English Laboratory -II	Global	To identify varied group discussion skills and apply them to table part in effective discussions in a professional context. To analyze concepts and Problems and Make effective presentations explaining them clearly and precisely.	CO1 Speak effectively in group discussions held in a formal/semi-formal contexts. CO2 Discuss, analyze and present concepts and Problems from various perspectives	PO-9 PO-10 PO-12

				To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them to attend interviews successfully. To Make them Employable Graduates and use English language skills effectively in various situations.	to arrive atsuitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	

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1.1.1 ELECTRONICS AND COMMUNICATION ENGINEERING

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English - I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs,definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To Make the students understand the concepts of vector calculus and applications. To acquaint the student with mathematical tools needed in evaluating ordinary differential equations and their applications.	CO1 Use the matrix algebra methods for solving practical Problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application Problems. CO4 Understand the concepts of Gradient, divergence and curl of a vector point function and related applications. CO5 Apply various techniques in solving ordinary differential equations.	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12
3	23PH102 BSC	Physics For Electronics Engineering	Global	To instill the essentials of properties of matter. To describe the principles of quantum mechanics and their various applications.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12

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				To provide the fundamental understanding of crystals and their numerous crystal formations. To recognize the modelling of conducting materials' transport properties using both classical and quantum theories. To become knowledgeable about semiconductors and understands the applications of magnetic materials.	engineering-related applications. CO2 Apply quantum theory's sophisticated physics notions to the matter's characterization. CO3 Know the fundamentals of crystal formations and growth methods. CO4 To understand about the creation of energy band structures, free electron theory, and quantum theory. CO5 To gain knowledge about semiconductor and magnetic materials, as well as the applications for them.	
4	23CY101 BSC	Engineering Chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterials. To introduce the basic concepts and applications of polymers and composites. To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.	CO1 Summarize the water related Problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterial in medicine, agriculture, energy, electronics and catalysis. CO3 Discuss the types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels. CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	PO-1 PO-2 PO-3 PO-7 PO-12

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5	23GE101 ESC	Problem Solving and C Programming	Global	To understand the fundamentals of Problem solving using Algorithm and Flowchart To teach the basic programming constructs for solving simple Problems To introduce the basic concepts of arrays and strings To acquaint the students about functions and pointers To develop applications in C using structures and union To impart knowledge on the concepts of file handling	CO1 Understand the basic concepts of Problem solving and C programming constructs CO2 Construct and implement C programs for solving computational Problems using arrays and strings CO3 Implement simple real-time applications in C using functions and pointers CO4Implement the applications in C using structures CO5 Implement the applications using file handling.	PO- 5 PO- 1 PO- 2 PO- 3 PO- 11
6	23GE103 HMSC	தமிழர்மரபு /Heritage of Tamils	National			
7	23BS112 BSC	Physics And Chemistry Laboratory for Electronics Engineering	Global	Physics Laboratory To learn the correct usage of several types of physics lab equipment. To learn, how to gather, present, and understand facts in a simple and succinct manner. To learn Physics-related Problem-solving abilities and experimental data interpretation. To identify experimental measurement error and the methods used to reduce it To encourage active participation from the learner in all aspects of the lab exercises. Chemistry Laboratory To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper. To induce the students to familiarize with electro analytical techniques such as, pH metry and potentiometry To Make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions.	Physics Laboratory CO1 Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves. CO2 Apply the principles of operations of semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids. CO3 Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures. CO4 Experiment the relationship between the light and matter & properties of liquids. CO5 Estimate the velocity of sound and compressibility of liquid. CHEMISTRY LABORATORY CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.	PO-1 PO-2 PO-8 PO-9 PO-10

				To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles CO5 Quantitatively analyse the impurities in solution by electroanalytical methods.	
8	23GE112 EEC	English Laboratory –I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing their opinions via various media.	CO1 To listen to and comprehend general as well as complex academic information. CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	PO-9 PO-10 PO-12
9	23HS201 HSMC	Professional English - II	Global	To engage learners in meaningful language activities to improve their reading and writing skills. To learn various reading strategies and apply in comprehending documents in professional context. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for Problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions. CO3 To analyze Problems in order to arrive at feasible solutions and communicate them in thewritten format. CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	PO-9 PO-10 PO-12

10	23MA203 BSC	Partial Differential Equations and Transforms	Global	To study the formation and solve the Partial Differential Equations. To understand the concepts of Dirichlet's conditions and Fourier series. To Study the application of transform techniques using Fourier Transforms. To understand the concept of Laplace transforms can be used for efficiently solving the problems that occur in various branches of engineering disciplines. To provide the basic concepts of Z-Transform and solve the difference equations.	CO1 To apply Partial Differential Equation in real time Engineering problems. CO2 To understand general periodic functions and apply in problems of Fourier series, which are sums of sines and cosines. CO3 To use the Fourier transform as the tool to connect the time domain and frequency domain in signal processing. CO4 To apply Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients. CO5 To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z - Transform techniques for discrete time systems.	PO-1 PO-2 PO-3 PO-4 PO-12 PO-9
11	23BE204 ESC	Electronic Devices	Global	To understand the basic concepts of semiconductor devices. To learn the characteristics of bipolar junctions. To inculcate the construction, characteristics of FET and MOSFET. To understand the special purpose semiconductor devices. To introduce the concepts of power devices and display devices.	CO1 Design simple rectifiers and voltage regulators using diodes CO2 Apply suitable biasing conditions to study the input and output characteristics of BJT CO3 Elaborate the operation of BJT using various transistor models CO4 Explore the characteristics and operation of JFET and MOSFET CO5 Compare the characteristics of special Semiconductor diodes CO6 Articulate the applications of Power and Display devices	PO-1 PO-2 PO-3
12	23CS201 ESC	Python Programming	Global	To learn to solve problems using Python conditionals and loops.	CO1 Develop simple python programs for applying the concepts of datatypes,	PO-1 PO-2 PO-3

				To define Python functions and use function calls to solve problems To use Python data structures - lists, tuples, dictionaries to represent complex data. To do input/output with files in Python To use python Exceptions and Libraries	expressions, and python statements CO2 Develop Python programs for solving real-time computational problems by using conditionals, looping, functions, and strings. CO3 Understand the concepts of compound data using Python lists, tuples, and dictionaries CO4 Develop python programs for solving computational problems by using modules, files, and python packages CO5 Develop python programs for solving computational problems by using Exceptions and Libraries	PO-4 PO-5 PO-11 PO-12
13	23EC201 PCC	Circuits Analysis	Global	To learn the basic concepts and behaviour of DC and AC circuits. To understand various methods of circuit/ network analysis using network theorems. To learn the concept of coupling in circuits. To understand the transient response of the circuits subjected to DC and AC excitations. To gain hands- on experience on verification of network theorems. To understand the working of RLC circuits and Two port networks.	CO1 Apply the basic concepts of Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits CO2 Apply suitable network theorems to analyze DC circuits CO3 Apply suitable network theorems to analyze AC circuits CO4 Analyze series, parallel resonance and coupled circuits CO5 Analyze the transient response for any RC, RL and RLC circuits CO6 Analyze the two port network parameters and properties CO7 Verify various network theorems and star delta conversion CO8 Analyze resonance circuits and transient response of RLC circuits and calculate Z and Y parameters	PO-1 PO-2 PO-3 PO-4 PO-10

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14	23GE901 BSC	Environmental Sciences And Sustainability	Global	To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on t biodiversity of India and its conservation. To impart knowledge on the causes, effects and control or prevention measures of environmental pollution. To study the dynamic processes and understand the features of the earth's interior and surface. To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them. To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization.	CO1 To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. CO2 To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. CO3 To identify the causes, effects of natural disasters and contribute to the preventive measures in the society. CO4 To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. CO5 To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	PO-6 PO-7 PO-9 PO-1 PO-2 PO-3 PO-4 PO-12
15	23GE201 HSMC	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	National			
16	23BE213 ESC	Electronic Devices Laboratory	Global	To learn the characteristics of basic electronic devices such as Diode, BJT, FET To learn the characteristics of power electronic devices such as UJT, SCR	CO1 Analyze the characteristics of basic electronic devices CO2 Analyze the characteristics of power electronic devices CO3 Analyze the characteristics of electronic devices using simulation software	PO-1 PO-2 PO-3 PO-4 PO-5 PO-9 PO-10
17	23CS211 ESC	Python Programming Laboratory	Global	To learn the basic programming constructs in Python. To practice various computing strategies for Python-based solutions to real world problems. To use Python data structures - lists, tuples, dictionaries.	CO1 Develop simple python programs for applying the concepts of datatypes, expressions, and python statements CO2 Develop Python programs using conditionals, looping,	PO- 1 PO- 2 PO- 3 PO- 4 PO- 5 PO- 8

				To do input/output with files in Python To use python Exceptions and Libraries	functions, and strings for solving real-time computational problems. CO3 Understand the concepts of compound data using Python lists, tuples, and dictionaries CO4 Develop python programs for solving problems by using modules, files, and python packages CO5 Utilize Python packages for developing real-world software applications	PO- 9 PO- 10 PO- 11 PO- 12
18	23GE212 EEC	English Laboratory -II	Global	To identify varied group discussion skills and apply them to table part in effective discussions in a professional context. To analyze concepts and Problems and Make effective presentations explaining them clearly and precisely. To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them to attend interviews successfully. To Make them Employable Graduates and use English language skills effectively in various situations.	CO1 Speak effectively in group discussions held in a formal/semi-formal contexts. CO2 Discuss, analyze and present concepts and Problems from various perspectives to arrive atsuitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	PO-9 PO-10 PO-12

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1.1.1 DEPARTMENT OF MECHANICAL ENGINEERING

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English-I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To make the students understand the concepts of vector calculus and applications. To acquaint the student with mathematical tools needed in evaluating ordinary differential equations and their applications.	CO1 Use the matrix algebra methods for solving practical problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application problems. CO4 Understand the concepts of Gradient, divergence and curl of a vector point function and related applications. CO5 Apply various techniques in solving ordinary differential equations.	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12
3	23PH101 BSC	Engineering Physics	Global	To instill the essentials of properties of matter. To gain knowledge of electromagnetic waves and its applications. To amplify the information on optical fiber for communication purposes.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications. CO2 Express their knowledge in electromagnetic waves. CO3 Infer the characteristics of laser for various Engineering applications and expand the	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12

NPR COLLEGE OF ENGG. & TECHNOLOGY NATHAM

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				To describe the principles of quantum mechanics and their various applications. To provide the fundamental understanding of crystals and their numerous crystal formations.	understanding of optical fibers use in communications. CO4 Apply quantum theory's sophisticated physics notions to the matter's characterization. CO5 Know the fundamentals of crystal formations and growth methods.	
4	23CY101 BSC	Engineering Chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterials. To introduce the basic concepts and applications of polymers and composites. To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.	CO1 Summarize the water related problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis. CO3 Discuss the types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels. CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	PO-1 PO-2 PO-3 PO-7 PO-12
5	23GE102 ESC	Problem Solving and Python Programming	Global	To understand the basics of algorithmic problem solving. To learn to solve problems using Python conditionals and loops. To define Python functions and use function calls to solve problems. To use Python data structures - lists, tuples, dictionaries to represent complex data. To do input/output with files in Python.	CO1 Understand the concepts of computational thinking and algorithmic problem-solving techniques. CO2 Develop simple python programs for applying the concepts of datatypes, expressions, and python statements. CO3 Develop Python programs for solving real-time computational problems by using conditionals, looping, functions, and strings. CO4 Understand the concepts of compound data using Python lists, tuples, and dictionaries. CO5 Develop python programs for solving computational problems by using modules, files, and python packages.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-11 PO-12
6	23GE103 HSMC	தமிழர்மர பு /Heritage of Tamils	Nation al			

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7	23GE111 ESC	Problem Solving and Python Programming Laboratory	Global	To understand the problem-solving approaches To learn the basic programming constructs in Python. To practice various computing strategies for Python-based solutions to real world problems To use Python data structures - lists, tuples, dictionaries To do input/output with files in Python.	CO1 Develop simple python programs for applying the concepts of datatypes, expressions, and python statements. CO2 Develop Python programs using conditionals, looping, functions, and strings for solving real-time computational problems. CO3 Understand the concepts of compound data using Python lists, tuples, and dictionaries. CO4 Develop python programs for solving problems by using modules, files, and python packages. CO5 Utilize Python packages for developing real-world software applications.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9 PO-10 PO-11 PO-12
8	23BS111 BSC	Physics and Chemistry Laboratory	Global	Chemistry Objective To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper. To induce the students to familiarize with electroanalytical techniques such as, pH metry and potentiometry To make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions. To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	Physics Labaoratory CO1 Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves. CO2 Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids. CO3 Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures. CO4 Experiment the relationship between the light and matter & properties of liquids. CO5 Estimate the thermal properties and thermal behavior of the material. Chemistry Laboratory CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO. CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles	PO-1 PO-2 PO-8 PO-9 PO-10

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					CO5 Quantitatively analyse the impurities in solution by electroanalytical methods.	
6	23GE112 EEC	English Laboratory - I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing their opinions via various media.	CO1 To listen to and comprehend general as well as complex academic information. CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	PO-12 PO-9 PO-10
7	23HS201 HSMC	Professional English-II	Global	To engage learners in meaningful language activities to improve their reading and writing skills. To learn various reading strategies and apply in comprehending documents in professional context. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions. CO3 To analyze problems in order to arrive at feasible solutions and communicate them in the written format. CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	PO-9 PO-10 PO-12
8	23MA201 BSC	Statistics and Numerical Methods	Global	This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology. To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.	CO1 Apply the concept of testing of hypothesis for small and large samples in real life problems. CO2 Apply the basic concepts of classifications of design of experiments in the field of agriculture. CO3 Apply the basic concepts and Techniques of solving algebraic and transcendental equations. CO4 Understand the numerical techniques of interpolation in various intervals and apply the numerical techniques of	PO-1 PO-2 PO-3 PO-4 PO-5 PO-9 PO-11 PO-12

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				To introduce the basic concepts of solving algebraic and transcendental equations. To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines. To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.	differentiation and integration for engineering problems. CO5 Solve the ordinary differential equations with initial conditions by using certain techniques with engineering applications.	
9	23PH204 BSC	Materials Science and Technology	Global	To recognize the phases involved in the materials and phase diagrams. To become knowledgeable about ferrous alloys and their applications. To describe the mechanical properties and methods to measure. To describe the properties and uses of dielectric, and superconducting materials. To explicate the properties and applications of advanced materials.	CO1 To inferring the fundamental knowledge in phase diagrams and explain its application in the field of materials science and engineering. CO2 To interpret the fundamentals of the Fe-Fe3C phase diagram, diverse microstructures, and alloys for engineering designs. CO3 To understand the fundamental mechanical properties of materials and their methods of measurement. CO4 To gain knowledge on dielectric, super conducting and their properties. CO5 To apply the suitable nanomaterials and shape memory alloys for specific engineering applications.	PO-1 PO-2 PO-3 PO-5 PO-7 PO-12
10	23BE201 ESC	Basic Electrical and Electronics Engineering	Global	To introduce the basics of electric circuits and analysis To import knowledge in the basics of working principles and application of electrical Machines To introduce analog devices and their characteristics To educate on the fundamental concepts of digital electronics To introduce the functional elements and working of measuring instruments	CO1 Compute the electric circuit parameters for simple problems CO2 Examine the working principle and applications of electrical machines CO3 Illustrate the characteristics of analog electronic devices CO4 Examine the basic concepts of digital electronics CO5 Apply the concepts of principles of measuring instruments for real time applications	PO-1 PO-2 PO-3 PO-7 PO-11 PO-12
11	23ME201 ESC	Engineering Mechanics	Global	To expose various laws of forces for the equilibrium of rigid bodies. To introduce the concept of properties of surfaces and solids.	CO1 Identify various force system in a plane. CO2 Solve equilibrium of rigid bodies in two dimensions.	PO-1 PO-2 PO-3

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				To impart knowledge on the fundamental of dynamics of particles and rigid bodies.	CO3 Calculate the centroid, areas and mass moment of inertia for surface and solids. CO4 Apply the concept of dynamics for particle motions. CO5 Determine the friction of elements and dynamics of rigid bodies.	PO-4 PO-12
12	23GE202 ESC	Engineering Graphics	Global	Drawing engineering curves. Drawing freehand sketch of simple objects. Drawing orthographic projection of solids and section of solids. Drawing development of solids. Drawing isometric and perspective projections of simple solids.	CO1 Construct the conic curves, involutes and cycloid. CO2 Solve practical problems involving projection of lines, points and plane surfaces CO3 Draw orthographic projection of solids and freehand sketch of simple objects. CO4 Draw the sectioning and development of simple solids. CO5 Draw isometric and perspective projections of simple solids.	PO-1 PO-2 PO-3 PO-10 PO-12
13	23GE201 HSMC	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	National			
14	23GE211	Engineering Practices Laboratory	Global	Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work. Wiring various electrical joints in common household electrical wire work. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.	CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. CO2 Wire various electrical joints in common household electrical wire work. CO3 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	PO-1 PO-2 PO-5 PO-6 PO-7 PO-12

15	23BE212 ESC	Basic Electrical and Electronics Engineering Laboratory	Global	To train the students in conducting load tests on electrical machines To gain practical experience in characterizing electronic devices To train the students to use DSO for measurements.	CO1 Perform the Verification of Ohm's and Kirchhoff's Laws for DC circuits. CO2 Analyze experimentally the load characteristics of electrical machines CO3 Analyze the characteristics of basic electronic devices CO4 Demonstrate use of DSO to measure the various parameters	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9
16	23GE212 EEC	English Laboratory - II	Global	To identify varied group discussion skills and apply them to take part in effective discussions in a professional context. To analyze concepts and problems and make effective presentations explaining them clearly and precisely. To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them attend interviews successfully. To make them Employable Graduates and use English language skills effectively in various situations.	CO1 Speak effectively in group discussions held in a formal/semi formal contexts. CO2 Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	PO-9 PO-10 PO-12

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1.1.1 Department of Artificial Intelligence & Data Science

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English-I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs,definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To Make the students understand the concepts of vector calculus and applications. To acquaint the student with mathematical tools needed in evaluating ordinary differential equations and their applications.	CO1 Use the matrix algebra methods for solving practical Problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application Problems. CO4 Understand the concepts of Gradient, divergence and curl of a vector point function and related applications. CO5 Apply various techniques in solving ordinary differential equations.	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12

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3	23PH101 BSC	Engineering physics	Global	To instill the essentials of properties of matter. To gain knowledge of electromagnetic waves and its applications. To amplify the information on optical fiber for communication purposes. To describe the principles of quantum mechanics and their various applications. To provide the fundamental understanding of crystals and their numerous crystal formations.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications. CO2 Express their knowledge in electromagnetic waves. CO3 Infer the characteristics of laser for various Engineering applications and expand the understanding of optical fibers use in communications. CO4 Applyquantum theory's sophisticat physics notions to the matter characterization. CO5 Know the fundamentals of crystal formations and growth methods.	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12
4	23CY101 BSC	Engineering chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterials. To introduce the basic concepts and applications of polymers and composites. To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.	CO1 Summarize the water related Problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterial in medicine, agriculture, energy, electronics and catalysis. CO3 Discuss the types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels. CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	PO-1 PO-2 PO-3 PO-7 PO-12

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5	23GE101 ESC	Problem solving and c programming	Global	To understand the fundamentals of Problem solving using Algorithm and Flowchart To teach the basic programming constructs for solving simple Problems To introduce the basic concepts of arrays and strings To acquaint the students about functions and pointers To develop applications in C using structures and union To impart knowledge on the concepts of file handling	CO1 Understand the basic concepts of Problem solving and C programming constructs CO2 Construct and implement C programs for solving computational Problems using arrays and strings CO3 Implement simple real-time applications in C using functions and pointers CO4 Implement the applications in C using structures CO5 Implement the applications using file handling.	PO- 5 PO- 1 PO- 2 PO- 3 PO- 11
6	23GE103 HSMC	தமிழர்மரபு /Heritage of Tamils	Nationa l			
7	23GE111 ESC	Problem solving and python programming laboratory	Global	To understand the problem solving approaches To learn the basic programming constructs in Python. To practice various computing strategies for Python-based solutions to real world problems. To use Python data structures - lists, tuples, dictionaries. To do input/output with files in Python	CO1 Develop simple python programs for applying the concepts of datatypes, expressions and python statements CO2 Develop Python programs using conditionals, looping, functions and strings for solving real-time computational problems. CO3 Develop python programs using lists, tuples, and dictionaries CO4 Develop python programs for solving problems by using modules, files and python packages CO5 Utilize Python packages for developing real-world software applications	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9 PO-10 PO-11 PO-12
8	23BS111 BSC	Physics and chemistry laboratory	Global	Physics Laboratory To learn the correct usage of several types of physics lab equipment.	CO1 Apprehend the concepts of interference, diffraction of light and recognize the	PO-1 PO-2 PO-

				To learn, how to gather, present, and understand facts in a simple and succinct manner. To learn Physics-related Problem-solving abilities and experimental data interpretation. To identify experimental measurement error and the methods used to reduce it To encourage active participation from the learner in all aspects of the lab exercises. CHEMISTRY LABORATORY To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper. To induce the students to familiarize with electro analytical techniques such as, pH metry and potentiometry To Make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions. To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	resonance concept of waves. CO2 Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids. CO3 Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures. CO4 Experiment the relationship between the light and matter & properties of liquids. CO5 Estimate the velocity of sound and compressibility of liquid. CHEMISTRY LABORATORY CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO. CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles CO5 Quantitatively analyse the impurities in solution by electro analytical methods.	8 PO-9 PO-10
9	23GE112 EEC	English laboratory- I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts	CO1 To listen to and comprehend general as well as complex academic information.	PO-9 PO-10 PO-12

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				To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing their opinions via various media.	CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	
10	23HS201 HSMC	Professional English - II	Global	To engage learners in meaningful language activities to improve their reading and writing skills. To learn various reading strategies and apply in comprehending documents in professionalcontext. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for Problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions. CO3 To analyze Problems in order to arrive at feasible solutions and communicate them in thewritten format. CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	PO-9 PO-10 PO-12
11	23MA201 BSC	Statistics And Numerical Methods	Global	This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology. To acquaint the knowledge of testing of hypothesis for small and large samples which plays an	CO1 Apply the concept of testing of hypothesis for small and large samples in real life problems. CO2 Apply the basic concepts of classifications of design of experiments in the field of agriculture. CO3 Understand the basic concepts and Techniques of solving	PO-1 PO-2 PO-3 PO-4 PO-5 PO-9 PO-11 PO-12

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				important role in real life problems. To introduce the basic concepts of solving algebraic and transcendental equations. To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines. To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.	algebraic and transcendental equations. CO4 Understand the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. CO5 Solve the ordinary differential equations with initial conditions by using certain techniques with engineering applications.	
12	23PH203 BSC	Physics For Information Science	Global	To understanding the fundamental physics of conducting materials, superconductors, and material characteristics. To impart fundamental knowledge of semiconductor device and electron transport characteristics. To get expertise in magnetic materials. To know how superconducting materials with null resistance and optical materials for optoelectronics work. To learn how nano electronic devices operate on a fundamental level.	CO1 To recognize the fundamental ideas behind different free-electron theories and establish the solids' electrical characteristics. CO2 To evaluate the functions of semiconductors and their uses. CO3 To employing quantum principles to examine the mechanisms at work in magnetic materials. CO4 To understand about the uses of superconducting and Optical properties of materials. CO5 To show the fundamentals of how micro- and nano-electronic equipment functions.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6 PO-7 PO-12
13	23BE201 ESC	Basic Electrical and Electronics Engineering	Global	To introduce the basics of electric circuits and analysis To import knowledge in the basics of working principles and application of electrical Machines To introduce analog devices and their characteristics To educate on the fundamental concepts of digital electronics	CO1 Compute the electric circuit parameters for simple Problems CO2 Examine the working principle and applications of electrical machines CO3 Illustrate the characteristics of analog electronic devices	PO-1 PO-2 PO-3 PO-7 PO-11 PO-12

				To introduce the functional elements and working of measuring instruments	CO4 Examine the basic concepts of digital electronics CO5 Apply the concepts of principles of measuring instruments for real time applications	
14	23CS901 ESC	Digital Principles and Computer Organization	Global	To analyze and design combinational circuits. To analyze and design sequential circuits. To understand the basic structure and operation of a digital computer. To study the design of data path unit, control unit for processor and to familiarize with the hazards. To understand the concept of various memories and I/O interfacing.	CO1 Design various combinational digital circuits using logic gates CO2 Describe the operation and construction of various flip flops. CO3 Design sequential circuits and analyze the design procedures. CO4 State the fundamentals of computer systems and analyze the execution of an instruction. CO5 Analyze different types of control design and identify hazards. CO6 Identify the characteristics of various memory systems and I/O communication. CO7 Design and implementation of combinational circuits. CO8 Design and implementation of sequential circuits.	PO-1 PO-2 PO-3 PO-4 PO -5 PO -12
15	23AD201 PCC	Data Structures Design	Global	To understand the principles underlying Abstract Data Types (ADTs) To create linear data structures encompassing lists, stacks, and queues. To comprehend algorithms for sorting, searching, and hashing. To utilize tree and graph structures. To utilize graph structures.	CO1 Understanding of Abstract Data Types (ADTs) and their practical implementations. CO2 Apply the Design and Implementation of Lists, Stacks, and Queues to Address Real-World Challenges CO3 Apply In-Depth Understanding of Sorting, Searching, and Hashing Algorithms for Effective Problem Solving CO4 Apply Profound Understanding of Trees to	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6 PO-8 PO-9 PO-10 PO-11 PO-12

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					Effectively Manage Hierarchical and Interconnected Data CO5 Analyze, Synthesize, and Innovate with Graph Structures for Complex Interconnected Data and Network Solutions	
16	23GE201 HSMC	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	National			
17	23GE211 ESC	Engineering Practices Laboratory	Global	Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work. Wiring various electrical joints in common household electrical wire work. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.	CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; Make joints in wood materials used in common household wood work. CO2 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. CO3 Wire various electrical joints in common household electrical wire work. CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	PO-1 PO-2 PO-5 PO-6 PO-7 PO-12

18	23AD211 PCC	Data Structures Design Laboratory	Global	To implement ADTs in Python To design and implement linear data structures -lists, stacks, and queues To implement sorting, searching and hashing algorithms To solve problems using tree structures To solve problems using graph structures	CO1 Analyzing and Applying Fundamental Data Structures and Recursive Algorithms in Python CO2 Design, implement, and analyses linear data structures, such as lists, queues, and stacks, according to the needs of different applications CO3 Design, implement, and analyses efficient tree structures to meet requirements such as searching, indexing, and sorting CO4 Analyzing Graph Representation Methods and Mastering Traversal Algorithms CO5 Design, implement, and analyses single source shortest path algorithmand minimum spanning tree algorithms	PO-1 PO-2 PO-3 PO-4 PO-5 PO-8 PO-9 PO-10 PO-11 PO-12
19	23GE212 EEC	English Laboratory -II	Global	To identify varied group discussion skills and apply them to table part in effective discussions in a professional context. To analyze concepts and Problems and Make effective presentations explaining them clearly and precisely. To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them to attend interviews successfully. To Make them Employable Graduates and use English language skills effectively in various situations.	CO1 Speak effectively in group discussions held in a formal/semi-formal contexts. CO2 Discuss, analyze and present concepts and Problems from various perspectives to arrive atsuitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6 PO-8 PO-9 PO-10 PO-11 PO-12

NPR COLLEGE OF ENGG. & TECHNOLOGY NATHAM

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1.1.1 Department of Information Technology

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23HS101 HSMC	Professional English - I	Global	To improve the communicative competence of learners. To learn to use basic grammatic structures in suitable contexts. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text. To help learners use language effectively in professional contexts. To develop learners' ability to read and write complex texts, summaries, articles, blogs,definitions, essays and user manuals.	CO1 To use appropriate words in a professional context and communicate in a professional context. CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions. CO4 To write definitions, descriptions, narrations and essays on various topics. CO5 To express their opinions effectively in both oral and written medium of communication.	PO-9 PO-10 PO-12
2	23MA101 BSC	Matrices and Calculus	Global	To develop the use of matrix algebra techniques that is needed by engineers for practical applications. To familiarize the student with functions of several variables. This is needed in many branches of engineering. To familiarize the students with integral calculus and various techniques of integration. To Make the students understand the concepts of vector calculus and applications.	CO1 Use the matrix algebra methods for solving practical Problems. CO2 Able to use differential calculus ideas on several variable functions. CO3 Apply integral calculus and multiple integral tools in solving various application Problems. CO4 Understand the concepts of Gradient, divergence and curl of a vector point function and related applications.	PO-1 PO-2 PO-3 PO-4 PO-9 PO-11 PO-12

COLLEGE OF ENGG. & TECHNOLOGY NATHAM NPR

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				To acquaint the student with mathematical tools needed in evaluating ordinary differential equations and their applications.	CO5 Apply various techniques in solving ordinary differential equations.	
3	23PH101 BSC	Engineering Physics	Global	To instill the essentials of properties of matter. To gain knowledge of electromagnetic waves and its applications. To amplify the information on optical fiber for communication purposes. To describe the principles of quantum mechanics and their various applications. To provide the fundamental understanding of crystals and their numerous crystal formations.	CO1 Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications. CO2 Express their knowledge in electromagnetic waves. CO3 Infer the characteristics of laser for various Engineering applications and expand the understanding of optical fibers use in communications CO4 Apply quantum theory's sophisticated physics notions to the matter characterization. CO5 Know the fundamentals of crystal formations and growth methods.	PO-1 PO-2 PO-3 PO-4 PO-7 PO-12
4	23CY101 BSC	Engineering Chemistry	Global	To inculcate sound understanding of water quality parameters and water treatment techniques. To impart knowledge on the basic principles and preparatory methods of nanomaterials. To introduce the basic concepts and applications of polymers and composites. To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. To familiarize the students with the operating principles,	CO1 Summarize the water related Problems in boilers and their treatment techniques. CO2 Discuss the applications of nanomaterial in medicine, agriculture, energy, electronics and catalysis. CO3 Discuss the types, properties and applications of polymers and composites. CO4 Summarize the fuels used for engineering processes and applications of fuels.	PO-1 PO-2 PO-3 PO-7 PO-12

				working processes and applications of energy conversion and storage devices.	CO5 Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	
5	23GE101 ESC	Problem Solving And C Programming	Global	To understand the fundamentals of Problem solving using Algorithm and Flowchart To teach the basic programming constructs for solving simple Problems To introduce the basic concepts of arrays and strings To acquaint the students about functions and pointers To develop applications in C using structures and union To impart knowledge on the concepts of file handling	CO1 Understand the basic concepts of Problem solving and C programming constructs CO2 Construct and implement C programs for solving computational Problems using arrays and strings CO3 Implement simple real-time applications in C using functions and pointers CO4 Implement the applications in C using structures CO5 Implement the applications using file handling.	PO- 5 PO- 1 PO- 2 PO- 3 PO- 11
6	23GE103 HMSC	தமிழர்மரபு /Heritage of Tamils	National			
7	23BS111 BSC	Physics And Chemistry Laboratory	Global	Physics Laboratory To learn the correct usage of several types of physics lab equipment. To learn, how to gather, present, and understand facts in a simple and succinct manner. To learn Physics-related Problem-solving abilities and experimental data interpretation. To identify experimental measurement error and the methods used to reduce it To encourage active participation from the learner in all aspects of the lab exercises. Chemistry Laboratory	CO1 Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves. CO2 Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids. CO3 Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures.	PO-1 PO-2 PO-8 PO-9 PO-10

				To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper. To induce the students to familiarize with electro analytical techniques such as, pH metry and potentiometry To Make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions. To demonstrate the analysis of metals and alloys. To demonstrate the synthesis of nanoparticles	CO4 Experiment the relationship between the light and matter & properties of liquids. CO5 Estimate the velocity of sound and compressibility of liquid. Chemistry Laboratory CO1 Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO. CO2 Determine the amount of metal ions through volumetric and spectroscopic techniques. CO3 Analyse and determine the composition of alloys. CO4 Learn simple method of synthesis of nanoparticles CO5 Quantitatively analyse the impurities in solution by electro analytical methods.	
8	23GE112 EEC	English Laboratory -I	Global	To improve the communicative competence of learners To help learners use language effectively in academic /work contexts To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts. To use language efficiently in expressing their opinions via various media.	CO1 To listen to and comprehend general as well as complex academic information. CO2 To listen to and understand different points of view in a discussion. CO3 To speak fluently and accurately in formal and informal communicative contexts. CO4 To describe products and processes and explain their uses and purposes clearly and accurately. CO5 To express their opinions effectively in both formal and informal discussions.	PO-9 PO-10 PO-12

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9	23HS201 HSMC	Professional English - II	Global	To engage learners in meaningful language activities to improve their reading and writing skills. To learn various reading strategies and apply in comprehending documents in professionalcontext. To help learners understand the purpose, audience, contexts of different types of writing. To develop analytical thinking skills for Problem solving in communicative contexts. To demonstrate an understanding of job applications and interviews for internship and placements.	CO1 To compare and contrast products and ideas in technical texts and write analytical essays. CO2 To identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions. CO3 To analyze Problems in order to arrive at feasible solutions and communicate them in thewritten format. CO4 To present their ideas and opinions in a planned and logical manner in industrial nature. CO5 To draft effective resumes in the context of job application.	PO-9 PO-10 PO-12
10	23MA901 BSC	Probability and Statistics	Global	To provide necessary basic concepts in probability. To understand the basic concepts of one - dimensional random variable and to introduce some standard distributions applicable to engineering which can describe real life phenomenon. To understand the basic concepts of two - dimensional random variables. To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life Problems. Apply the basic concepts of classifications of design of experiments in the field of agriculture.	CO1 To Understand the fundamental concepts of probability. CO2 By applying the knowledge of one-dimensional random variables to standard distributions which can describe real life phenomenon. CO3 Understand the basic concepts of two-dimensional random variables and apply in engineering applications. CO4 Apply the concept of testing of hypothesis for small and large samples in real life Problems. CO5 Apply the basic concepts of classifications of design	PO-1 PO-2 PO-3 PO-4 PO-5 PO-9 PO-11 PO-12

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					of experiments in the field of agriculture.	
11	23PH203 BSC	Physics For Information Science	Global	To understanding the fundamental physics of conducting materials, superconductors, and material characteristics. To impart fundamental knowledge of semiconductor device and electron transport characteristics. To get expertise in magnetic materials. To know how superconducting materials with null resistance and optical materials for optoelectronics work. To learn how nano electronic devices operate on a fundamental level.	CO1 To recognize the fundamental ideas behind different free-electron theories and establish the solids' electrical characteristics. CO2 To evaluate the functions of semiconductors and their uses. CO3 To employing quantum principles to examine the mechanisms at work in magnetic materials. CO4 To understand about the uses of superconducting and Optical properties of materials. CO5 To show the fundamentals of how micro- and nano-electronic equipment functions.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6 PO-7 PO-12
12	23BE201 ESC	Basic Electrical and Electronics Engineering	Global	To introduce the basics of electric circuits and analysis To import knowledge in the basics of working principles and application of electrical Machines To introduce analog devices and their characteristics To educate on the fundamental concepts of digital electronics To introduce the functional elements and working of measuring instruments	CO1 Compute the electric circuit parameters for simple Problems CO2 Examine the working principle and applications of electrical machines CO3 Illustrate the characteristics of analog electronic devices CO4 Examine the basic concepts of digital electronics CO5 Apply the concepts of principles of measuring instruments for real time applications	PO-1 PO-2 PO-3 PO-7 PO-11 PO-12
13	23GE901 BSC	Environmental Sciences and Sustainability	Global	To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on t	CO1 To recognize and understand the functions of environment, ecosystems and	PO-6 PO-7 PO-9 PO-1

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				biodiversity of India and its conservation. To impart knowledge on the causes, effects and control or prevention measures of environmental pollution. To study the dynamic processes and understand the features of the earth's interior and surface. To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them. To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization.	biodiversity and their conservation. CO2 To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. CO3 To identify the causes, effects of natural disasters and contribute to the preventive measures in the society. CO4 To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. CO5 To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	PO-2 PO-3 PO-4 PO-12
14	23CS201 PCC	Python Programming	Global	To guide students in problem-solving using Python conditionals and loops effectively. To guide students in problem-solving using Python conditionals and loops effectively. To enable students to utilize Python data structures such as lists, tuples, and dictionaries for representing complex data. To assist students in performing input/output operations with files in Python. To support students in using Python exceptions and libraries proficiently.	CO1 Understand the concepts of python data types, expressions and statements CO2 Implement Python programs for solving real-time computational Problems by using conditionals, looping, functions and strings CO3 Understand the concepts of compound data using Python lists, tuples and dictionaries CO4 Implement the python programs for solving computational Problems by using	PO-1 PO-2 PO-3 PO-4 PO-5 PO-11 PO-12

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					modules, files and python packages CO5 Implement the python programs for solving computational Problems by using Exceptions and Libraries	
15	23GE201 HSMC	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	National			
16	23GE211 ESC	Engineering Practices Laboratory	Global	Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work. Wiring various electrical joints in common household electrical wire work. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.	CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; Make joints in wood materials used in common household wood work. CO2 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. CO3 Wire various electrical joints in common household electrical wire work. CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	PO-1 PO-2 PO-5 PO-6 PO-7 PO-12
17	23CS211 PCC	Python Programming Laboratory	Global	To ensure students acquire proficiency in basic	CO1 Understand the concepts of data types,	PO- 1 PO- 2

				programming constructs in Python. To provide opportunities for students to apply various computational strategies to develop Python-based solutions for real-world problems. To enable students to effectively utilize Python data structures such as lists, tuples, and dictionaries. To guide students in performing input/output operations with files in Python. To support students in utilizing Python exceptions and libraries appropriately.	expressions and statements of python CO2 Implement the Python programs using conditionals, looping, functions and strings for solving real-time computational Problems. CO3 Implement the Python programs using lists, tuples and dictionaries CO4 Implement the python programs for solving Problems by using modules, files and python packages CO5 Utilize the Python packages for developing real-world software applications	PO- 3 PO- 4 PO- 5 PO- 8 PO- 9 PO- 10 PO- 11 PO- 12
18	23GE212 EEC	English Laboratory -II	Global	To identify varied group discussion skills and apply them to table part in effective discussions in a professional context. To analyze concepts and Problems and Make effective presentations explaining them clearly and precisely. To enhance the Employability and Career Skills of students and acquire professional skills required for workplace / higher education. To develop their confidence and help them to attend interviews successfully. To Make them Employable Graduates and use English language skills effectively in various situations.	CO1 Speak effectively in group discussions held in a formal/semi-formal contexts. CO2 Discuss, analyze and present concepts and Problems from various perspectives to arrive atsuitable solutions. CO3 Make effective presentations in an attractive way using appropriate vocabulary. CO4 Attend job interviews and be successful in them. CO5 Develop adequate Soft Skills required for the workplace.	PO-9 PO-10 PO-12

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1.1.1 M.E.VLSI

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23VL101 PC	Graph Theory and Optimization Techniques	Global	To introduce graph as mathematical model to solve connectivity related problems. To introduce fundamental graph algorithms. To familiarize the students with the formulation and construction of a mathematical model for a linear programming problem in a real life situation. To provide knowledge and training using non-linear programming under limited resources for engineering and business problems. To understand the applications of simulation modelling in engineering problems.	CO1 Apply graph ideas in solving connectivity related problems CO2 Apply fundamental graph algorithms to solve certain optimization problems. CO3 Formulate and construct mathematical models for linear programming problems and solve the transportation and assignment problems. CO4 Model various real life situations as optimization problems and effect their solution through Non-linear programming CO5 Apply simulation modeling techniques to problems drawn from industry management and other engineering fields.	PO-1 PO-3 PO-4
2	23VL102 PCC	Low Power VLSI Design	Global	To identify sources of power in an IC. To identify the power reduction techniques based on technology independent and technology dependent methods To identify suitable techniques to reduce the power dissipation To estimate power dissipation of various MOS logic circuits To develop algorithms for low power dissipation	CO1 Find the power dissipation of MOS circuits CO2 Design and analyze various MOS logic circuits CO3 Apply low power techniques for low power dissipation CO4 Estimate the power dissipation of ICs CO5 Develop algorithms to reduce power dissipation by software tools	PO-1 PO-3 PO-4 PO-5
3	23VL103 PCC	Analog Circuit Design	Global	Analog Circuits play a very crucial role in all electronic systems and due to continued miniaturization, many of the analog blocks are not getting realized in CMOS technology. The most important building blocks of all CMOS analog IC will be the topic of study in this course. The basic principle of operation, the circuit choices and the tradeoffs involved in the MOS transistor level design common to all	CO1 Design amplifiers to meet user specifications CO2 Analyse the frequency and noise performance of amplifiers CO3 Design and analyse feedback amplifiers and one stage op amps CO4 Design and analyse two stage op amps	PO-1 PO-2 PO-3 PO-4 PO-5

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				To create public awareness about the benefits of Intellectual property among students To Provide legal certainty to inventors/ Patent applicants	ensure accuracy and facilitate data analysis CO3 Ability to transform and model the collected data to discover useful information for decision making CO4 Ability to awareness about the benefits of Intellectual property CO5 Ability to take up legal certainty while applying for Patent	
7	23VL111 PCC	Analog Circuit Design Laboratory	Global	Carry out a detailed analog circuit design starting with transistor characterization and finally realizing an IA design At various stages of design, exposure to state of art CAD VLSI tool in various phases of experiments designed to bring out the key aspects of each important module in the CAD tool including the simulation, layout, LVS and parasitic extracted simulation. To understand the problem solving approaches To learn the basic programming constructs in Python. To practice various computing strategies for Python-based solutions to real world problems. To use Python data structures - lists, tuples, dictionaries. To do input/output with files in Python	CO1 Design digital and analog Circuit using CMOS given a design specification. CO2 Design and carry out time domain and frequency domain simulations of simple analog building blocks, study the pole zero behaviors and compute the input/output impedances CO3 Use EDA tools for Circuit Design	PO-1 PO-2 PO-1 PO-2 PO-3 PO-4 PO-5 PO-6
8	23VL201 PCC	Designing With FPGA	Global	To acquire knowledge on Hardware Description Languages, Programmable logic devices and FPGAs, design of FPGA based systems, Combinational and sequential networks, FPGA architecture and Large FPGA Systems.	CO1 Design digital circuit using HDL and explain the architectures of Programmable logic devices and FPGAs. CO2 Design of FPGA based systems, digital networks, architectures and Large FPGA systems	PO-1 PO-3 PO- 4
9	23VL202 PCC	RFIC Design	Global	To study the various impedance matching techniques used in RF circuit design. To understand the functional design aspects of LNAs, Mixers, PLLs and VCOs. To understand frequency synthesis.	CO1 Understand the principles of operation of an RF receiver front end. CO2 Design and apply constraints for LNAs, Mixers and frequency synthesizers	PO-1 PO-3 PO-4 PO-5

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					CO3 Analyze and design mixers CO4 Design different types of oscillators and perform noise analysis CO5 Design PLL and frequency synthesizer	
10	23VL203 PCC	VLSI Testing	Global	To introduce the VLSI testing. To introduce logic and fault simulation and testability measures To study the test generation for combinational and sequential circuits To study the design for testability. To study the fault diagnosis	CO1 Understand VLSI Testing Process CO2 Develop Logic Simulation and Fault Simulation CO3 Develop Test for Combinational and Sequential Circuits CO4 Understand the Design for Testability CO5 Perform Fault Diagnosis.	PO-1 PO-3 PO-4 PO-5 PO-6
11	23VL204 PCC	System Verilog	Global	Insight to Apply System Verilog Concepts to Do Synthesis, Analysis and Architecture Design. Understanding of System Verilog and SVA for Verification and Understand the Improvements in Verification Efficiency. Understand Advanced Verification Features, such as the Practical Use of Classes, Randomization, Checking, and Coverage. Knowledge to Communicate the Purpose and Results of a Design Experiment in Written and Oral Understand The Purpose of Hardware-Software Verification	CO1 Use system Verilog to create correct, efficient, and re-usable models for digital designs CO2 Use system 63erilog to create testbenches for digital designs CO3 Understand and effectively exploit new constructs in System Verilog for verification CO4 Understand the communication between modules CO5 Designing a complete system model using Verilog	PO-1 PO-3 PO-4 PO-5 PO-6
12	23VL211 PCC	FPGA Laboratory	Global	To help engineers read, understand, and maintain digital hardware models and conventional verification test benches written in Verilog and System Verilog. To provide a critical language foundation for more advanced training on System Verilog	CO1 Understand and use the System Verilog RTL design and synthesis features, including new data types, literals, procedural blocks, statements, and operators, relaxation of Verilog language rules, fixes for synthesis issues, enhancements to tasks and functions, new hierarchy and connectivity features, and interfaces.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6

1.1.1 DEPARTMENT OF MANAGEMENT STUDIES

S.NO	COURSE CODE	COURSE NAME	NEED	DESCRIPTION OF OBJECTIVES	COURSE OUTCOME	PO MAPPING
1	23MB101 PC	Management Concepts and Organizational Behavior	Global	To familiarize the students to the basic concepts of management in order to aid in understanding how an organization functions, and in understanding the complexity and wide variety of issues managers face in today's business firms.	CO1 The student will be able to UNDERSTAND and various management concepts and skills required in the business world. CO2 The student will be able to EXPLAIN how In-depth knowledge of various functions of management in a real time management context. CO3 The student will be able to UNDERSTAND complexities associated with management of individual behavior in the organizations. CO4 The student will be able to ANALYZE the skillset to have manage group behaviour in Organizations. CO5 The student will be able to IDENTIFY Insights about the current trends in managing organizational behaviour.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6
2	23MB102 PC	Managerial Economics	Global	To provide a foundation with the concepts and tools of economic analysis as relevant for managerial decision making and to provide an understanding of the aggregate economic system within which a firm Operates.	CO1 Understand the basic concept with the help of economic principles. CO2 Appraise the knowledge of demand and supply under different business decisions. CO3 Examine the concept of production function and role of technology. CO4 Analyze the importance of matching costs with different time frames. CO5 Differentiate the output and price decision of firms under different market structures..	PO-1 PO-2 PO-6

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3	23MB103 PC	Accounting for Management	Global	To understand Accounting tools and techniques. To analyze and interpret financial statements. To recognize the roles of budgets variance as tools of planning and control.	CO1 Comprehend the basic principles of accounting. CO2 Prepare and interpret the financial statements, namely Trading Accounts, Profit and Loss Account and Balance Sheet. CO3 Assess the financial soundness of the company using Ratio analysis. CO4 Construct the Fund flow statements and analyze the financial statements using fund flow. CO5 Differentiate the output and price decision of firms under different market structures.	PO-1 PO-2 PO-4 PO-6
4	23MB104 PC	Research Methodology	Global	To make the students of tourism understand the principles of scientific methodology in business enquiry, develop analytical skills of business research and to prepare scientific business reports.	CO1 Understand the research process, Research Problem and literature review. CO2 Identify the criteria for evaluating data collection methods, and Preparation of Questionnaire Design. CO3 Apply the principles of sampling and data preparation to the contemporary business research problems. CO4 Assess different types of testable hypotheses and interpret the statistical test. CO5 Construct a report writing and proposal writing in business research.	PO-1 PO-2 PO-3
5	23MB105 PC	Design Thinking and Innovation	Global	To familiarize the students to the basic concepts of design thinking in understanding the complexity and wide variety of issues managers face in today's business firms.	CO1 The student will be able to UNDERSTAND the Fundamentals of Design Thinking. CO2 The student will be able to EXPLAIN how Frame Problems and Generate Innovative Ideas. CO3 The student will be able to PRACTICE Scale and	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6

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					Implement Innovative Solutions. CO4 The student will be able to ANALYZE Integrate Design Thinking into Business Strategy. CO5 The student will be able to IDENTIFY and Scale and Implement Innovative Solutions.	
6	23MB106 PC	Statistics for Management	Global	To learn the applications of statistics in business decision making.	CO1 To facilitate objective solutions in business decision making. CO2 To understand and solve business problems. CO3 To apply statistical techniques to data sets, and correctly interpret the results CO4 To develop skill-set that is in demand in both the research and business environments CO5 To enable the students to apply the statistical techniques in a work setting	PO-1 PO-2 PO-3 PO-4 PO-6
7	23MB111 NEC	Seminar on Emerging Trends in Business Management - II	Global	To enable the learners on successful completion of the course the learner will be able to read and analyze books.		
8	23MB112 EEC	MS-Office for Managers	Global	On successful completion of the course the learner will be able to work on Ms-Word, Ms-Excel and Ms-Power point		
9	23MB113 PC	Business Communication (Lab)	Global	To familiarize the students with various forms of communication that exists in business and to train them in practical applications of communication.	CO1 Demonstrate his/her ability to write a business document. CO2 Exercise critical thinking by designing and developing content for presentations. CO3 Participate effectively in groups with emphasis on	PO-1 PO-2 PO-3 PO-4

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					listening, thinking & responding.	
10	23MB201 PC	Marketing Management	Global	To introduce the fundamental concepts and theories in the area of marketing and assist the students to take marketing decisions.	CO1 Comprehend the various concepts in marketing and the global marketing Environment of firms. CO2 Analyze the consumer buying behavior by apply the principles of segmentation, targeting and positioning. CO3 Examine the product mix and brand strategy for the product and services. CO4 Compare the pricing and channel strategy based on real world market and company objectives. CO5 Selecting media strategy to reach the target audience and deliver the brand promise through an IMC campaign for a variety of brands.	PO-1 PO-2 PO-4 PO-5 PO-6
11	23MB202 PC	Financial Management	Global	Understand the operational nuances of a Finance Manager. Comprehend the technique of making decisions related to finance functions.	CO1 Examine the risk return trade off involved in the functions of financial management. CO2 Weigh investment opportunities using investment appraisal techniques and select appropriate investments. CO3 Compare the impact of specific and overall cost of capital on capital structure. CO4 Defend the capital structure decisions made using leverage. CO5 Relate the influence of dividend policy adopted by the firm on the share prices.	PO-1 PO-2 PO-4 PO-6
12	23MB203 PC	Human Resource Management	Global	To familiarize the students with Human Resource Management. Concepts and functions. To help the students in identifying problems in the	CO1 Classify the functions of human resources and understanding the strategies for existing environment. CO2 Appraise the methods of recruitment and prepare a	PO-1 PO-2 PO-4 PO-6

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				management of Human Resources. To acquaint the students with different strategies and legislations used in management of HR related issues in the organization	selection strategy for a specific job. CO3 Demonstrate appropriate implementation, monitoring and assessment procedures of training and design compensation schemes that are cost effective, improve productivity and comply with the legal framework. CO4 Demonstrate knowledge on appraisal method and develop strategies to empower employees. CO5 Investigate the enrichment concepts in HRM with its latest trends.	
13	23MB204 PC	Business Analytics	Global	Use business analytics decision making. To apply the appropriate analytics and generate solutions. Model and analyse the business situation using analytics.	CO1 Ability to understand the role of Business Analytics in decision making. CO2 Ability to identify the appropriate tool for the analytics scenario. CO3 Ability to apply the descriptive analytics tools and generate solutions. CO4 Understanding of Predictive Analytics and applications. CO5 Knowledge of Prescriptive Analytics and demonstrating business process improvement.	PO-1 PO-2 PO-3 PO-4 PO-5 PO-6
14	23MB205 PC	Operations Management	Global	To provide a broad introduction to the field of operations management and explain the concepts, strategies, tools and techniques for managing the transformation process that can lead to competitive advantage.	CO1 Interpret the concepts in operation management and product design.. CO2 Appraise the appropriate forecasting techniques to different business situations. CO3 Elucidate the factors influencing location, process and layout decision. CO4 Examine the various techniques in the strategic operations planning decisions.. CO5 Analysis the functions of inventory in operation and	PO-1 PO-2 PO-4 PO-5 PO-6

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					examine the suitable modern operations management techniques for improving productivity.	
15	23MB206 PC	Legal Aspects of Business	Global	The objective of this course is to familiarize the students with various laws that will help them to refine their understanding of how law affects the different aspects of business.	CO1 Describe data by measures of location and dispersion for managerial decision making. CO2 Present data in tables and charts and make meaningful interpretation from charts comprehend probability concepts and apply probability concepts to various business problems. CO3 Use probability concepts to various business problems. CO4 Apply probability distributions to business situations. CO5 Examine the pattern of relationship between variables and make a prediction about dependent variable and perform distribution – free tests..	PO-1 PO-2 PO-4
16	23MB207 PC	Quantitative Techniques for Decision Making	Global	To apply quantitative techniques in modeling and solving business related problems.	CO1 Formulate and use linear programming techniques to solve and justify decisions in different operational functions of business. CO2 Understand and use transportation and assignment problems to implement the best routes and allocation of resources in matching supply and demand. CO3 Formulate and appraise the different network models for minimizing costs, distance and time in industrial and business projects. CO4 Examine the optimal strategies that are formulated for a conflicting business situation where two or more competitors are involved.	PO-1 PO-2 PO-4 PO-5

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					CO5 Appraise the decision theory models and select the best outcome from the different alternatives in situation.	
17	23MB211 EEC	Seminar on Emerging Trends in Business Management - II	Global	On successful completion of the course the will enrich the knowledge on Emerging trends in Management.		
18	23MB212 PC	Data analysis and Business Modelling (Lab)	Global	To familiarize the students with the use of SPSS package for analysis and interpretation of statistical data.	CO1 Use statistical software for data preparation and summarise the data(make better analysis and presentation of the data). CO2 Perform data cleaning activities and make better analysis and presentation of the data. CO3 Find group differences using parametric and non - parametric test for a given data set.	PO-1 PO-2 PO-4

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